AUDITOR GENERAL
Alberta

Report of the Auditor General of Alberta

MARCH 2015

AUDITOR GENERAL
Alberta

Mr. Matt Jeneroux, MLA
Chair
Standing Committee on Legislative Offices

I am honoured to send my *Report of the Auditor General of Alberta—March 2015* to Members of the Legislative Assembly of Alberta, as required by Section 19(5) of the *Auditor General Act*.

[Original signed by Merwan N. Saher, FCA]

Merwan N. Saher, FCA
Auditor General

Edmonton, Alberta
March 6, 2015

Contents

AUDITOR GENERAL'S MESSAGE 5

MARCH 2015 RECOMMENDATIONS 9

STAND-ALONE SYSTEMS AUDITING – NEW AUDITS
Education—Systems to Improve Student Attendance in Northland School Division 17
Energy—Alberta Energy Regulator—Systems to Regulate Pipeline Safety and Reliability in Alberta 39
Environment and Sustainable Resource Development
—Flood Mitigation Systems 71
—Systems to Regulate Dam Safety 87

STAND-ALONE SYSTEMS AUDITING—FOLLOW-UP AUDIT
Innovation and Advanced Education—Medicine Hat College International Education Division 99

OTHER AUDIT WORK
Innovation and Advanced Education—Report on Post-secondary Institutions 107
International and Intergovernmental Relations—Alberta's International Offices 121

GLOSSARY 125

Auditor General's Message and Recommendations

REPORT OF THE AUDITOR GENERAL OF ALBERTA

March 2015

Auditor General's Message

Student attendance, flood mitigation, pipeline monitoring, dam safety, international offices and post-secondary education illustrate the breadth of government activity covered by the audits in this report. That breadth also provides us an opportunity to identify common themes in our audit findings.

It is clear to us from these diverse audits that the quality of the systems the government uses to manage its work is proportional to the quality of the oversight it provides. In other words, good oversight will invariably produce better systems to achieve desired results.

In our July 2014 report[1] we described a results management framework, the purpose of which is to learn from results and improve programs. Oversight is the glue that holds results management together. If more people practiced proper oversight, the results could be spectacular. Those who are responsible for oversight need to:

- be vigilant
- check that processes and systems, including the accountability-for-results system, are working well
- signal preferred behaviour

all in the pursuit of desired results.

Student attendance in the Northland School Division remains unacceptably low. We have recommended that the Department of Education exercise oversight of the division's plans to improve student attendance. In our view, oversight is the key to not failing another generation of the division's children.

The Department of Environment and Sustainable Resource Development is not able to demonstrate that its systems are adequately regulating dam safety. Our audit findings point to inadequate oversight of the Dam Safety staff within the department.

In contrast, our audit findings for pipeline monitoring illustrate the influence of good oversight. The Alberta Energy Regulator, with a board and management that think as regulators, has systems that demonstrate it is performing its essential function—ensuring that pipeline operators act responsibly, with public safety and the environment as their priority. The AER can improve and we make recommendations to that end.

Our reports on post-secondary institutions over the last few years are evidence of the improvements that occur when oversight is vigorous and focused on demanding improvement. By way of caution, we repeat our observation that good financial control systems will be sustained only if vigorous oversight continues.

Report Highlights

An important part of our mandate is to examine and report on the government's management control systems. Through systems audits, we identify opportunities and propose solutions to improve the use of public resources. This report contains primarily the results of systems audits.

[1] *Report of the Auditor General of Alberta—July 2014*, pages 25-32.

Education—Systems to Improve Student Attendance in Northland School Division

Regular school attendance is critical to student success. Poor attendance has been a significant and longstanding problem in the Northland School Division, which comprises 2,700 students in 24 schools located in northern Alberta. We found the division has no operational plan with short- and long-term targets to improve student attendance. Further, the Department of Education has not provided purposeful oversight—it has not responded to inadequate action to improve attendance. At the operational level, schools have inadequate processes and controls to ensure attendance data is reliable.

Energy—Alberta Energy Regulator—Systems to Regulate Pipeline Safety and Reliability in Alberta

Pipelines are an essential component of the energy industry in Alberta. The primary responsibility for maintaining safe and reliable pipelines rests with their operators. The Alberta Energy Regulator's role is to ensure that pipeline operators act responsibly, with public safety and the environment as their priority. We found that the AER has adequate systems and processes to ensure operators comply with regulatory obligations. Albertans can be assured that the regulator is performing its essential function. However, there is room for improvement. The AER should:

- use its risk management activities to make informed decisions on allocating resources and determine the nature and extent of activities to oversee pipeline operations
- complete a skills gap analysis and formalize a training program for its core pipeline staff
- improve measures to assess pipeline regulatory and industry performance
- expand its analysis of incident contributing factors beyond primary causes and share lessons learned with industry and operators

These are areas in which we believe AER should focus to meet its goal to be a leading regulator.

Environment and Sustainable Resource Development—Flood Mitigation Systems

Flooding is one of the most costly and destructive natural disasters in Canada. Every year, governments typically spend millions of dollars cleaning up after floods and providing disaster assistance to municipalities, businesses and people who suffered losses. Flooding is also a significant risk to public safety. Effective flood mitigation can reduce the damage caused by floods. Our audit of the government's flood mitigation systems found weaknesses in two key places:

- identifying flood hazard areas and establishing processes for controlling, regulating or prohibiting future land use or development in designated flood hazard areas
- establishing processes to assess the cumulative effect of flood mitigation actions in communities when approving new projects or initiatives

Risks to public safety and the public purse are avoidable with effective flood mitigation.

In 2013 the *Municipal Government Act* was changed to allow the Government of Alberta to make regulations to control, regulate or prohibit any use or development of land in a floodway. The Department of Municipal Affairs is working on the *Floodway Development Regulation* to limit property damage and risk to public safety from future floods within a floodway. Once complete, the Department of Municipal Affairs needs to establish systems to implement and enforce the regulation.

Environment and Sustainable Resource Development—Systems to Regulate Dam Safety

While the responsibility for the structural integrity and safety of dams rests with dam owners, the department is responsible for regulating the safety of dams, including the dams the department owns.

The department does not have adequate systems to regulate dam safety in Alberta. A number of improvements to dam safety regulatory processes are needed—we found that critical elements of a well-functioning regulator are either not being performed or evidence is lacking that processes are being carried out as intended. Foundational activities like a plan and the reporting of the results of regulatory activities are not being completed.

The department's senior executive is not receiving the necessary information to assert that dams in Alberta are being appropriately regulated. At the most basic level, reporting should allow important questions to be answered, such as: Has the department completed enough work and received enough information from dam owners to conclude on the safety of dams? Are changes needed to regulatory activities based on risks identified? Currently, no performance metrics, results analysis or identification of areas for future improvement are being prepared on dam safety in Alberta.

Innovation and Advanced Education—Report on Post-secondary Institutions

All institutions have improved their processes. In particular the Alberta College of Art + Design has made significant improvements. Olds College and Northern Lakes College improved some processes and increased their finance department's capacity. However, both institutions have work to do. The next challenge for a number of the institutions is to work on implementing recommendations that have been outstanding for more than three years.

Innovation and Advanced Education—Medicine Hat College International Education Division

In July 2013 we reported that the International Education Division was operating without oversight by the college's board, placing the institution at reputational and financial risk. We are pleased to report that all of our recommendations have now been implemented. These changes have improved the college's transparency and accountability for the results of its international education activities. The college stopped admitting new students at its offshore campuses in China and pursued an exit strategy that supports students to complete programs in progress.

International and Intergovernmental Relations—Alberta's International Offices

We again recommend that the Department of International and Intergovernmental Relations improve the processes management uses to evaluate the performance of each international office.

In 2014 Premier Prentice requested a review to ensure the activities of each office were optimally aligned with the government's international strategy. In February 2015 the department identified cost saving opportunities based on the results of the review. This review may form the basis of the department developing ongoing periodic in-depth reviews of each office.

To fully implement the recommendation, the department must finalize its processes to regularly perform periodic in-depth reviews of each office's continued relevance and cost effectiveness. Variance analysis and adequate descriptions of performance measures methodology for individual offices should be regularly reported and updated as the government's international strategy and priorities change.

March 2015 Recommendations

We conducted our audits in accordance with the *Auditor General Act* and the standards for assurance engagements of the Chartered Professional Accountants of Canada.

This report contains one repeated and 15 new recommendations to government. The repeated recommendation has been made because we do not believe there has been sufficient action taken to implement our previous recommendation.

As part of the audit process, we provide recommendations to government in documents called management letters. We use public reporting to bring recommendations to the attention of Members of the Legislative Assembly. For example, members of the all-party Standing Committee on Public Accounts refer to the recommendations in our public reports during their meetings with representatives of government departments and agencies.

We believe all of the recommendations in this report require a formal public response from the government. In instances where a recommendation has been made to a board-governed organization, we expect the organization to implement the recommendation and report back to its respective government ministry as part of proper oversight of the organization. By implementing our recommendations, the government will significantly improve the safety and welfare of Albertans, the security and use of the province's resources, or the oversight and ethics with which government operations are managed.

Reporting the status of recommendations

We follow up on all recommendations. The timing of our follow-up audits depends on the nature of our recommendations. To encourage timely implementation and assist with the planning of our follow-up audits, we require a reasonable implementation timeline on all recommendations accepted by the government or the entities we audit that report to the government. We recognize some recommendations will take longer to fully implement than others, but we encourage full implementation within three years. Typically, we do not report on the progress of an outstanding recommendation until management has had sufficient time to implement the recommendation and we have completed our follow-up audit work.

We repeat a recommendation if we find that the implementation progress has been insufficient.

We report the status of our recommendations as:

- **Implemented**—We explain how the government implemented the recommendation.
- **Repeated**—We explain why we are repeating the recommendation and what the government must still do to implement it.

On occasion, we may make the following comments:

- **Satisfactory progress**—We may state that progress is satisfactory based on the results of a follow-up audit.
- **Progress report**—Although the recommendation is not fully implemented, we provide information when we consider it useful for MLAs to understand management's actions.

SYSTEMS AUDITING—NEW AUDITS

Education—Systems to Improve Student Attendance in Northland School Division

Page 23

RECOMMENDATION 1: DEVELOP PLAN TO IMPROVE STUDENT ATTENDANCE

We recommend that Northland School Division develop an operational plan with short- and long-term targets to improve student attendance. The operational plan should include:

- measurable results and responsibilities
- a prioritized list of student-centred strategies, initiatives and programs
- documentation of the costs and resources required to action the strategies, initiatives and programs
- a specific timeline for implementation
- reporting on progress and accountability for improved attendance results

Implications and risks if recommendation not implemented

Without a specific plan to improve attendance, the division is less likely to put resources into the most critical areas to implement programs and processes to optimize student success.

Page 23

RECOMMENDATION 2: OVERSIGHT BY THE DEPARTMENT

We recommend that the Department of Education exercise oversight of Northland School Division by ensuring:

- the division develops and executes an operational plan to improve student attendance
- the operational plan identifies the resources needed and how results will be measured, reported and analyzed

Implications and risks if recommendation not implemented

Without appropriate oversight by the department, the division's likelihood of success is reduced and the risk of failing another generation of the division's children increases.

Page 30

RECOMMENDATION 3: MONITOR AND ENFORCE STUDENT ATTENDANCE

We recommend that Northland School Division improve its guidance and procedures for schools to:

- consistently record and monitor student attendance
- benchmark acceptable attendance levels
- manage and follow up on non-attendance

Implications and risks if recommendation not implemented

Without systematic monitoring and reporting on attendance, the division will not consistently identify and support those students with chronic non-attendance.

Energy—Alberta Energy Regulator—Systems to Regulate Pipeline Safety and Reliability in Alberta

Page 46

RECOMMENDATION 4: USE RISK MANAGEMENT ACTIVITIES TO MAKE INFORMED DECISIONS

We recommend that the Alberta Energy Regulator use its risk management activities to make informed decisions on allocating resources and determine the nature and extent of activities to oversee pipelines.

Implications and risks if recommendation not implemented

By not using risk management activities to inform operations activities, the AER risks not focusing on the highest impact activities and may not meet its pipeline regulatory requirements effectively.

Page 46

RECOMMENDATION 5: FORMALIZE TRAINING PROGRAM FOR CORE PIPELINE STAFF

We recommend that the Alberta Energy Regulator complete a skills gap analysis and formalize a training program for its core pipeline staff.

Implications and risks if recommendation not implemented

Without a skills gap analysis and a formal and comprehensive training program for its core pipeline staff, the AER risks not having all the skilled staff necessary to carry out its current and planned activities.

Page 51

RECOMMENDATION 6: IDENTIFY PERFORMANCE MEASURES AND TARGETS

We recommend that the Alberta Energy Regulator identify suitable performance measures and targets for pipeline operations, assess the results obtained against those measures and targets, and use what it learns to continue improving pipeline performance.

Implications and risks if recommendation not implemented

Management does not have all of the relevant tools it needs to make good decisions and evaluate the results of its pipeline oversight function. In the absence of meaningful performance measures and targets, Albertans cannot readily know if the regulator is achieving its pipeline goals effectively.

Page 53

RECOMMENDATION 7: REVIEW PIPELINE INCIDENT FACTORS

We recommend that the Alberta Energy Regulator:

- expand its analysis of pipeline incident contributing factors beyond the primary causes
- promptly share lessons learned from its investigations with industry and operators

Implications and risks if recommendation not implemented

If pipeline incidents are not fully investigated for contributing factors, the regulator, industry and the public cannot be sufficiently satisfied that everything reasonably possible is being done to avoid similar incidents in the future.

Energy—Alberta Energy Regulator—Monitoring and Enforcement of Pipeline Safety and Reliability in Alberta (continued)

Page 56

RECOMMENDATION 8: ASSESS CURRENT PIPELINE INFORMATION

We recommend that the Alberta Energy Regulator complete an assessment of its current pipeline information needs to support effective decision making, and determine the type and extent of data it should collect from pipeline operators, through a proactive, risk-based submission process.

Implications and risks if recommendation not implemented

Without a proper assessment of its data needs, the AER is at risk of not having sufficient and relevant information to make informed decisions. This in turn puts the AER at a greater than necessary risk of not fulfilling its regulatory duties effectively.

Page 59

RECOMMENDATION 9: IMPLEMENT RISK-BASED COMPLIANCE PROCESS

We recommend that the Alberta Energy Regulator implement a cost effective risk-based compliance process to evaluate the adequacy and effectiveness of pipeline operators' integrity management programs, and safety and loss management systems.

Implications and risks if recommendation not implemented

Without a risk-based compliance process to assess the effectiveness of operator integrity management programs, and safety and loss management systems, the AER is at risk of missing an opportunity to enhance pipeline safety and achieving its objectives and targets for incident reduction.

Environment and Sustainable Resource Development—Flood Mitigation Systems

Page 76

RECOMMENDATION 10: UPDATE FLOOD HAZARD MAPS AND MAPPING GUIDELINES

We recommend that the Department of Environment and Sustainable Resource Development improve its processes to identify flood hazards by:

- mapping flood areas that are not currently mapped but are at risk of flooding communities
- updating and maintaining its flood hazard maps
- updating its flood hazard mapping guidelines

Implications and risks if recommendation not implemented

The department cannot adequately protect people and communities from floods and their effects without current and complete information on flood hazards.

Page 78

RECOMMENDATION 11: ASSESS RISK TO SUPPORT MITIGATION POLICIES AND SPENDING

We recommend that the Department of Environment and Sustainable Resource Development conduct risk assessments to support flood mitigation decisions.

Implications and risks if recommendation not implemented

The department cannot effectively develop flood mitigation strategies without current flood hazard and risk assessment information.

Environment and Sustainable Resource Development—Flood Mitigation Systems (continued)

Page 80

RECOMMENDATION 12: DESIGNATE FLOOD HAZARD AREAS AND COMPLETE FLOODWAY DEVELOPMENT REGULATION

To minimize public safety risk and to avoid unnecessary expenditure of public money, we recommend that the:

- Department of Environment and Sustainable Resource Development identify flood hazard areas for designation by the minister
- Department of Municipal Affairs:
  - establish processes for controlling, regulating or prohibiting future land use or development to control risk in designated flood hazard areas
  - put in place processes to enforce the regulatory requirements

Implications and risks if recommendation not implemented

Allowing development in floodways unnecessarily risks public safety and the public purse. Keeping people and infrastructure away from floodways is the most cost effective approach to managing flood risk in areas where experts can predict water flows will be deepest, fastest and most destructive.

Page 82

RECOMMENDATION 13: ASSESS EFFECTS OF FLOOD MITIGATION ACTIONS

We recommend that the Department of Environment and Sustainable Resource Development establish processes to assess what will be the cumulative effect of flood mitigation actions in communities when approving new projects and initiatives.

Implications and risks if recommendation not implemented

If the department does not assess the cumulative effect of flood mitigation programs and initiatives prior to approving new ones, some communities may be over protected and others under protected from future floods.

Environment and Sustainable Resource Development—Systems to Regulate Dam Safety

Page 90

RECOMMENDATION 14: DEVELOP PLAN TO REGULATE DAMS

We recommend that the Department of Environment and Sustainable Resource Development develop a plan to regulate dams and report on the results of its regulatory activities.

Implications and risks if recommendation not implemented

Without a plan, the department is likely to use its resources inefficiently or ineffectively. Without a report, the minister and public cannot hold the department accountable for its regulatory responsibilities.

Environment and Sustainable Resource Development—Systems to Regulate Dam Safety (continued)

Page 92

RECOMMENDATION 15: IMPROVE DAM REGULATORY ACTIVITIES

We recommend that the Department of Environment and Sustainable Resource Development improve its dam regulatory activities by:

- maintaining a reliable registry of dams
- obtaining sufficient information to assess the risk and consequences of dam failure
- retaining evidence of regulatory activities performed
- following up to ensure that owners correct deficiencies or manage them until they are corrected

Implications and risks if recommendation not implemented

Without making these improvements to its processes the department cannot demonstrate it is fully meeting its regulatory responsibilities.

OTHER AUDIT WORK

International and Intergovernmental Relations—Alberta's International Offices

Page 121

RECOMMENDATION 16: EVALUATING INTERNATIONAL OFFICES' PERFORMANCE—REPEATED

We again recommend that the Department of International and Intergovernmental Relations improve the processes management uses to evaluate the performance of each international office.

Implications and risks if recommendation not implemented

As the global marketplace changes quickly, management needs current and reliable information on the continued relevance and cost effectiveness of each office. Without regularly scheduled, thorough reviews of each office, management may not be able to effectively manage any risks to achieving its strategic goals.

Stand-alone Systems Auditing—New Audits

REPORT OF THE AUDITOR GENERAL OF ALBERTA

March 2015

Education—Systems to Improve Student Attendance in Northland School Division

SUMMARY

Regular school attendance is critical to student success. Poor student attendance has been a significant and longstanding problem in Northland School Division. About one-third of the division's students remain chronically absent despite many years of reporting on this situation, and despite what was to have been a concerted attempt to deal with attendance following the 2010 Inquiry Team Report.[1] Factors that contribute to poor attendance are numerous and complex.

At the school division and Department of Education levels, the story is simpler; necessary improvements have not been made, despite the need being highlighted in the inquiry report and in commitments made afterward. The division has not produced a workable plan; oversight at all levels, including the department, has failed. Lack of coordination, weaknesses in reporting systems; and the absence of a student-centred approach are all contributors.

One factor stands out—poor attendance is too often accepted as the status quo.

This is not a situation that's accepted elsewhere in Alberta. Reports and statements by school officials and ministers of education have suggested that poor attendance would not be accepted in Northland School Division either. But it has been. And it still is.

While student attendance problems are wrapped up in other challenges facing northern communities, dealing with non-attendance has not been a priority or thought to be achievable until other problems are solved. A more direct and purposeful approach is available.

Our recommendations deal directly with failures at the institutional level. They call for the department to provide better oversight and the division to develop an effective operational plan.

Because school attendance involves students and their families or caregivers, we consulted the community for views of groups and families directly involved. This approach was necessary to produce an accurate and comprehensive report. It also reflected the principle that our office is accountable to Albertans as well as to Members of the Legislative Assembly. Our community consultations found a strong desire for a better school experience among the people directly affected, and several strong ideas about how to improve things.

What we examined

Our audit objective was to assess if the division has adequate systems to improve student attendance.

We examined accountability for attendance results systems and looked at the division's oversight of its schools and the department's oversight of the division. We interviewed staff and tested attendance practices at 10 schools across the division, at the division's central office and at the department.

---

[1] The Northland School Division Inquiry Team Report to the Honourable Dave Hancock, Minister of Education, Department of Education, November 2010.

We also held meetings to discuss student attendance in two communities—Wabasca–Desmarais and Gift Lake. We met with key stakeholders including parents and caregivers, students and former students, teachers and other school staff, administrators, local school board committee members, elders and other community members.

Conclusion

The division's schools and central office do not have adequate systems to improve student attendance. There is no accountability for attendance results at all levels of the division and by the department. Oversight of attendance improvement by both the department and the division is inadequate.

What we found

In January 2010 the Minister of Education dismissed the division's elected school board, appointed an official trustee and called for a full inquiry. Poor attendance was one of his main concerns. Many recommendations were made in late 2010. They had been made before too.

We expected the division to develop an action plan to guide the implementation of required changes. We also expected the department to put the full force of its expertise and resources into supporting the division and its schools and provide regular oversight on the plan development and the results from its implementation—instead we found no actionable plan on improving attendance by the division and oversight of improved attendance has failed at every level in the division and by the department. The result after five years is limited progress; attendance remains unacceptably low.

Systems to monitor attendance within the division are not well designed or operating as intended. At least one-third of the division's 2,700 students[2] are chronically absent and there are no plans in place to monitor their attendance or make the necessary improvements to better support them. Schools do not have consistent processes to record attendance and controls over attendance are weak. The division has not provided schools adequate guidance on recording and monitoring attendance, does not have processes to ensure attendance data is reliable and accurate, and does not have adequate support and training for its attendance tracking system.

We had planned to analyze the division's attendance data for the past five years. But the data is inconsistent and the system lacks controls, so we could not include this assessment as part of our audit results. We also planned to compare this information to student results on provincial achievement and diploma exams and the division's tracking of teacher absences and bus route operations to identify potential trends or correlations between these factors and student attendance. This analysis would provide valuable information to the division in understanding some of the indirect factors that impact student attendance.

The division's strategies on student attendance have not resulted in system-wide improvements. The division has not analyzed attendance results to identify the root causes of poor attendance. Schools do not provide sufficient information because the reasons for student absences and follow-up actions are not documented. Annual school plans lacked detail in identifying strategies for improvement and had inadequate reporting of results. The division's combined three-year business plan and annual education results reporting did not incorporate attendance strategies from its schools' plans, and did not provide

[2] This information is based on accumulated absences reported on June 2014 attendance registers for the 2013–2014 school year in the division's attendance tracking system. Chronically absent in this context means a student missed 20 per cent or more of school days over the year.

detailed information on steps taken to improve attendance. The division reported specific attendance results to the department in its quarterly education reports. The department failed to take action despite continuing low results.

What needs to be done

To achieve its objective to improve attendance, the division must develop an operational plan with short- and long-term targets to improve attendance. The plan needs:

- measurable results and responsibilities
- a prioritized list of student-centred strategies, initiatives and programs
- documentation of the costs and resources required to action the strategies, initiatives and programs
- a specific, achievable timeline for implementation
- reporting on progress and accountability for improved attendance results

The department must oversee the division to ensure it develops and implements this plan. The department also needs to ensure the plan establishes the resources required and how results will be measured, reported and analyzed.

Student attendance will not improve because of a single act or strategy or program. The division and its schools must provide support for students including those with chronic non-attendance. Each of the division's communities is unique and the schools' students reflect this diversity. Understanding and assessing the needs of each student is critical to success.

The challenge for the division is that the reasons students do not attend school are complex. They are intertwined in many layers of First Nation and Métis history. There has been a history of inaction due to the complexity and the magnitude of the challenges. Results will not improve without significant changes. Coordinated action is paramount.

The division's central office can better support its schools by improving its guidance and procedures to monitor student attendance. This action would include developing a consistent approach for schools to manage and follow up on non-attendance. The office can also improve controls to ensure student attendance data is accurate and reliable. Reliable data is the basis of a good system.

Why this is important to Albertans

All students in Alberta have a right and a responsibility to attend school and receive an education. The Department of Education has to ensure appropriate systems are in place to make this happen. Attendance systems are not working in Northland School Division. Improving these systems is critical to the future success of the children.

AUDIT OBJECTIVES AND SCOPE

Our audit objective was to assess if there are adequate systems to improve student attendance in Northland School Division. Attending school regularly is essential to educational achievement. To succeed in school, students must attend.

We examined attendance data for the division and assessed the systems individual schools and the division use to monitor attendance. We developed an understanding of the programs and initiatives to improve attendance results—incentives and sanctions to enforce compulsory attendance required by

the *School Act* and to identify and mitigate the underlying barriers to attendance such as the relationship between student attendance, engagement and achievement.

Our scope included activities and strategies implemented since January 2010, when the minister appointed an official trustee and a three-member inquiry team.

Two areas, both important factors in providing a safe and healthy learning environment for the students, were not included in our audit scope:

Governance—A governance model is critical to show collaboration and engagement between the communities and schools within the division. School boards give an important voice to parents in the communities. The dissolution of the division's school board in January 2010 means that a legislative change is required to the *Northlands School Division Act.* The department has said it expects changes soon, so we excluded governance from our audit.

School infrastructure and teacher housing—Mould, poor air quality and the deterioration of some schools are risks to student safety and a positive learning environment. Teacher housing has been identified repeatedly as causing reduced teacher satisfaction and retention. The condition of school facilities and teacher housing is beyond the scope of our audit. We may audit this area another time.

We conducted our field work from June 2014 to February 2015. We substantially completed our audit on February 12, 2015. Our audit was conducted in accordance with the *Auditor General Act* and the standards for assurance engagements set by the Chartered Professional Accountants of Canada.

BACKGROUND

School attendance is mandatory in Alberta. The *School Act* requires individuals between the ages of six and sixteen years to attend school.[3] Parents and caregivers have the main responsibility for a student's attendance at school. The *School Act* sets out school jurisdictions' right to make rules with respect to student attendance.[4] Regular school attendance is a critical factor in student success. No school system or its learning initiatives will be successful if students are not regularly attending. Non-attendance is an early indicator that a student is at risk of not completing high school and can be a symptom of a range of underlying barriers to attendance.

Northland School Division

Northland School Division covers a large portion of northern Alberta. Its 24 schools have 2,700 students.[5] The vast territory creates challenges, as there are often large distances between schools and the division's central office in Peace River or the nearest major centre.

The division was formed in 1960 to bring several former Métis schools and First Nations mission and residential schools together under provincial standards. The plan was to bring these schools together within a provincial school jurisdiction so that problems such as poor infrastructure, a lack of qualified

[3] The *School Act RSA2000*, Section 13(1). Mandatory school age will increase to 17 in the new *Education Act*, which was passed by the legislature in December 2012 but has not been proclaimed into effect.
[4] *The School Act RSA2000*, Section 60(3)(b).
[5] Total enrolment for 2013–2014 was 2,703—Alberta Education.

teachers and poor communication could be improved. The legacy of the residential school history in the division is strong: it hired some teachers from former residential schools as those schools were closed.[6]

The division is Alberta's only primarily Aboriginal school jurisdiction; 95 per cent of its student population is made up of students from First Nations, six of Alberta's eight Métis settlements and non-status Aboriginals living off-reserve. The division's 2013–2014 budget was $60.5 million (2012–2013 $61.9 million).

In our visits to the division and its schools, we better understood the significant obstacles they face. Gift Lake's students and staff have been relocated many times over the past four years because of mould problems. Bussing was a big problem for a quarter of the division's schools in 2013–2014.[7] Mistassiniy School's students and staff have dealt with eleven separate student deaths from the community since mid-2011. Father R. Perin School began the 2014–2015 school year with an almost all new staff and administration, as only one of its staff returned from the prior year.

The division's chronic problems include high teacher and staff absences and turnover; deteriorating infrastructure; poor facilities (libraries, science and computer labs); insufficient support for students with English as a second language and for students with learning disabilities; and intergenerational effects of residential schools including poverty, addictions, mental health and family trauma. These challenges are complicated by the division's vast size and remoteness and small size of its schools.

Improving the education outcomes for Alberta's First Nations, Métis and Inuit young people has been one of the department's main goals for over 10 years.[8] However, success has been elusive. Within the division, the department has studied this problem repeatedly for the past 40 years. The most recent was the Inquiry Team Report in 2010. The report summarizes 10 recurring recommendations that have been made each decade without significant improvement (see Appendix A for details).

In January 2010 the Minister of Education replaced the division's 23-member board of trustees with an official trustee and appointed a three-person inquiry team to review the division's operations. The minister took this action due to concerns over student achievement, low graduation rates and high teacher and administrator turnover. The inquiry focused on student achievement, governance and instructional and administrative leadership. The inquiry team made 48 recommendations for improvement in its November 2010 report: 31 of them are directed to the division and 17 to the department or the province.[9]

---

[6] Northland—The Founding of a Wilderness School System, by J.W. Chalmers.

[7] Buses in Fort Chipewyan ran 30 per cent of the time. Five other schools in the division had no bussing for 10 per cent or more of school days.

[8] As identified in the First Nations, Métis and Inuit Education Policy Framework, Alberta Education, 2002; in Alberta Education's business plans from 2010 to 2013, Goal Three: Success for First Nations, Métis and Inuit Students (FNMI); and in Alberta Education's 2014 business plan, Goal Two: Success for Every Student, including eliminating the achievement gap between FNMI students and all other students.

[9] The Inquiry Team Report addressed three recommendations directly to the province of Alberta rather than the Department of Education. The recommendations deal with the division's boundaries (recommendation #1) and specific amendments to legislation (recommendations #38 and 42).

The department identified three areas that the division would focus on:

- developing English and Aboriginal language and numeracy
- improving student attendance
- working with a community based team to strengthen parental engagement with schools by improving communication and trust

The minister also formed a community based team to assess and respond to the inquiry report recommendations. This team submitted its report in January 2012, prioritizing the 48 recommendations and outlining a community engagement framework.

In June 2014 the department publicly released the report and responded to Inquiry Team and Community Engagement Team Reports. The department reported that of the 48 recommendations, 12 were implemented and 32 were accepted, including the recommendation to improve student attendance. Four were not accepted.

The division reports its progress implementing the Inquiry Team recommendations in its annual combined business plan and results report. In the report, the division's achievement remains among the lowest in the province.

FINDINGS AND RECOMMENDATIONS

Strategies to improve attendance and reduce absences

Background

The department does not receive or monitor attendance data from school jurisdictions. The department monitors performance based on an accountability framework that uses a consistent set of performance measures to report on results. Measures of attendance are not part of the department's performance reporting. The department also makes several resources and tools, based on best practices, available at school jurisdictions.

A key part of the department's performance reporting process is the development of a combined Annual Education Results Report (AERR) and a three-year business plan from each Alberta school jurisdiction. The department provides guidance through key department goals that each jurisdiction must include in their reporting. The Field Services Division performs a compliance review of jurisdictions' business plans and results reporting. The department issues a compliance letter if its requirements are met.

Since 2012 the division has reported on its progress implementing recommendations made in the Inquiry Team Report. This includes the recommendation to improve attendance and several others that deal with barriers to student attendance.

The division also gives the department a quarterly Education Report. This is required under funding agreements between the department and the division. Reports include updates on divisional priorities, enrolment, staffing positions, staff and student attendance, and school and division success stories.

The division superintendent requires each school to prepare its own annual education plan and results report to support the division's combined AERR and three-year business plan. Division administration reviews each report and provides feedback to schools if reporting is insufficient. Schools receive guidance from the division on which goals to include. In the 2012–2013 and 2013–2014 school years the division required schools to include student attendance in their annual reports.

RECOMMENDATION 1: DEVELOP PLAN TO IMPROVE STUDENT ATTENDANCE

We recommend that Northland School Division develop an operational plan with short- and long-term targets to improve student attendance. The operational plan should include:

- measurable results and responsibilities
- a prioritized list of student-centred strategies, initiatives and programs
- documentation of the costs and resources required to action the strategies, initiatives and programs
- a specific timeline for implementation
- reporting on progress and accountability for improved attendance results

RECOMMENDATION 2: OVERSIGHT BY THE DEPARTMENT

We recommend that the Department of Education exercise oversight of Northland School Division by ensuring:

- the division develops and executes an operational plan to improve student attendance
- the operational plan identifies the resources needed and how results will be measured, reported and analyzed

Criteria: the standards for our audit

The division should have systems to:

- clearly communicate student attendance objectives and strategies to meet them
- establish reasonable targets to measure progress in meeting attendance objectives
- develop and implement initiatives to achieve attendance objectives
- support schools in using strategies to promote attendance and remove barriers to attendance
- report on attendance results and the outcomes of attendance objectives
- periodically evaluate its progress in meeting attendance objectives against established targets
- analyze results to assess if any change in approach is necessary

To ensure adequate oversight by the department, the division should:

- give the department enough information on its progress in improving attendance
- receive enough guidance from the department on its strategies to improve attendance

Our audit findings

KEY FINDINGS

- The division's strategies have not improved student attendance.
- The division has not identified root causes of non-attendance. Schools do not adequately document the reason for school absences and follow-up actions taken.
- The division has not assessed best practices from other jurisdictions or its own schools to improve attendance.
- The department's oversight has failed because it did not signal changes in preferred behaviour when the division reported limited action to improve attendance.
- Department resources are not coordinated with the division's efforts to improve attendance.

Operational plan to improve attendance

School strategies

i. Strategies to improve attendance

School plans for 2012–2013 and 2013–2014 have several strategies to improve attendance, such as:

- **strategies to directly encourage attendance**—acknowledgement of good attendance in school assemblies, newsletters and letters home; notices on bulletin boards and other common areas; incentive programs offering small prizes, gifts and lunches
- **strategies to improve attendance monitoring**—phone calls home when students are absent, increased home visits, discussions at regular staff meetings
- **strategies to indirectly encourage attendance**—operational school buses, improved school maintenance; more option classes, field trips, sports equipment and teams, career fairs

Results reporting on specific strategies was limited. Half of the schools did not set a measurable target for their attendance plans. Schools with a target did not evaluate the effectiveness of specific strategies. There was little continuity in attendance plans from one year to the next.

The superintendent said division staff review the plans, but the division has no process to assess or document feedback to administrators on their plans. Because of limited reporting on results, the division cannot share best practices among schools.

Division strategies and initiatives

i. Annual education plans

In the annual plans we reviewed, the division identified attendance as a priority. The division has focused on developing a division-wide literacy strategy and other strategies intended to reduce barriers to student engagement and attendance and relied on each school to develop its own community based initiatives to increase attendance, as noted above.

The division had not set measurable targets to monitor its progress in improving student attendance. The division's attendance plans do not incorporate the strategies in individual school plans.

ii. Department review of annual education plans

We examined reporting for the past three years. In the past two years the department commended the division for preparing well-developed and comprehensive reports. The department repeatedly noted the division's low results on the department's performance reporting. In 2012 the department acknowledged the results are "indicative of the numerous challenges such as student attendance, teacher retention, student achievement, curricular knowledge, and understanding and incorporating cultural differences, the jurisdiction is grappling with."

Northland School Division's New attendance initiative

During our audit, the division developed a new attendance improvement initiative. The initiative was approved by the Official Trustee on January 30, 2015. This activity shows that the division is ready to actively work on its attendance systems and results.

The committee made 29 recommendations—18 to the division's schools and 11 to central office. The report identifies many important areas where improvements are required but doesn't provide sufficient direction and guidance on how schools are to implement 18 new recommendations.

Recommendation wording is vague in some instances. An absence of clear definitions, objective measures and direct wording will result in inconsistent application of recommendations at schools and central office.

The following factors indicate a lack of strategic planning to implement and monitor the initiative:

- Realistic goals for the initiative are missing in the set timeframe.
- Objective milestones to measure progress are missing.
- Neither the committee nor the division has developed a plan to actively monitor the outcomes of the initiative or report its results.
- Neither central office nor individual schools have fully considered the time or human and financial resources required to implement the 29 recommendations.
- The division asked schools to begin implementing working recommendations in September 2014. But during our field work, neither the committee nor the division had a process to monitor schools' progress implementing the recommendations.

The initiative does not include all the elements required of a robust plan but it is a good starting point. The division can use the information to create a workable operational plan to implement sustainable changes.

Analyzing results and seeking best practices

Division processes to improve attendance have not resulted in significant improvements. Some schools have successful strategies but it is hard to isolate and share them due to a lack of evidence-based documentation and reporting on results.

i. Community consultation

To better understand how key stakeholders within the division view attendance, we held meetings in two communities with parents and caregivers, grandparents, students, former students, teachers, administrators, local school board committee members, elders and other community leaders. They discussed what is and is not working and what could best improve attendance. Common themes from these discussions were:

- Some parents and guardians have not ensured their children regularly attend school. Some families may require older children to look after younger siblings, and travel with family members is sometimes required to larger communities for needed services and appointments.
- Some students in the division face multiple barriers getting to and staying in school. At home they may face poverty, addictions and a lack of parental/guardian support. At school they may face academic challenges, bullying and peer pressure.
- Systemic issues include transportation, poor infrastructure, a lack of programming options and extracurricular activities, high teacher absentee rates and turnover and intergenerational effects of residential schools and racism.

Further details of what we heard from communities are included in Appendix B.

These themes are similar to what the Inquiry Team reported from their consultations with 23 communities in 2010.[10] Student attendance has improved very little over the past five years. Because the need is so great, a strategic approach is required. The division is not responsible for resolving all these problems as some are beyond the education system's ability to tackle. Consideration must be made of what factors the division can directly influence and which require other support programs or communities to resolve. A risk-based approach would focus attention on the students.

ii. Student-centred approach

A new approach to improving student attendance, focused on building success at each level, is required.

Other school jurisdictions have had success increasing attendance. The division can learn from them by investigating practices others have used to successfully support students and assessing if they would work in the division. For example, Edmonton Catholic Schools established the FNMI High School Graduation Coach Program at St. Joseph High School in 2009. From 2008 through 2011, the program increased the school's FNMI graduation rates from 14.9 per cent to 60.4 per cent.[11] The program focuses on relationships and mentoring, transitions, culture, career counselling, academics and parental engagement. The program has since been introduced in three other Edmonton high schools.

In Fort McMurray both the Catholic and public school districts have had significant success improving high school completion and provincial achievement and diploma results for their First Nations, Métis and Inuit students.[12] The districts identified attendance as a "matter of connectivity: each student needs to be connected with the school and with an educational program that is meaningful."[13]

These programs succeed by connecting with each student and having a learning/career plan for each student. They have a dedicated counsellor/coach establish a relationship with each student and build a range of supports for them. They focus on establishing a sense of belonging and pride in their culture and history. And on celebrating success and planning for the future.

Early intervention is imperative because readiness for school is another important factor.[14] Students' needs must be assessed early to establish good attendance practices with family support. Junior high is a key focus for transitions and connecting with students to establish a foundation for success. Fort McMurray Catholic School District indicated that students who reach Grade 10 will very likely graduate.[15]

Implications and risks if recommendation not implemented

Without a specific plan to improve attendance, the division is less likely to put resources into the most critical areas to implement programs and processes to optimize student success.

---

[10] Northland School Division Inquiry Team Report, November 2010, Appendix 7, Part C, pages 36-47.
[11] High School Graduation Coach Program Evaluation, November 2014, Researcher: Sean Lessard, K-12 Inspire Institute, page 38 of 48.
[12] First Nation, Métis and Inuit Education: Promising practices in Fort McMurray, Alberta Education, November 2013.
[13] Ibid, page 4.
[14] The need for early intervention was identified as one of the 10 recurring recommendations identified in Appendix A.
[15] First Nation, Métis and Inuit Education: Promising practices in Fort McMurray, Alberta Education, November 2013.

Oversight by the department

The lack of improvement of student attendance systems at the division highlights a failure of oversight throughout the division and by the department. The department has not held the division accountable for improving attendance results systems despite it being a long-standing problem and the division repeatedly indicating plans to improve attendance were not working. The department must ensure the Official Trustee holds the division superintendent accountable for improving student attendance results systems.

The department and the division have spent time and money on initiatives and projects with significant potential. But they have failed to get the desired results. The following are examples. These efforts have largely failed because of the lack of a coordinated strategy, action plan and consistent support.

Inquiry team and community engagement team reports

In preparing its report, the Inquiry Team visited each community in the division and consulted widely with stakeholders. The communities felt they were being heard and the longstanding problems in their schools were a key government priority. Attendance was identified as a priority recommendation. The report also made other recommendations in many areas that have been identified as barriers to attendance.

After the Inquiry Report, the department and the division set up an action team to assess the recommendations. Regular meetings were held and an initial proposed costing was developed by the division, but it was not acted on. The frequency of meetings decreased over time. The division continued to report its actions and progress in quarterly education reports and in its annual education plan but any significant progress stalled.

When the department released the Inquiry Team Report in January 2011, it announced a Community Engagement Team would assess the report and provide a community based response. The Community Engagement Team provided its response to the department in January 2012. The department's strategy in response to these two reports was first submitted to the minister in April 2013. The department and the minister were publicly silent on both reports until June 2014.

The division and its schools have launched a literacy strategy across the division, which was another priority identified in the Inquiry Team Report and an important factor in supporting student success. They have worked towards other strategies related to Inquiry Team Report recommendations that can be incorporated and prioritized into an overall student-centred approach. The division has reported its ability to make needed changes has been hampered due to funding and resource limitations and the overwhelming extent of the needs.

In the four years since the Inquiry Team Report was released, the division, with the department's oversight, has made only limited progress implementing the report's recommendations focused on improving attendance because they have not worked together to:

- form a multi-stakeholder implementation team to develop and deliver strategies for improvement identified in the Inquiry Report
- develop an operational plan to identify the timing, cost and resources required to make needed changes
- agree on a coordinated strategy to make needed changes

Other department initiatives and strategies

The department has designed programs to assist school jurisdictions improve attendance and First Nations, Métis and Inuit achievement. Each of the following represents a missed opportunity by the department to potentially make significant change in the division to improve student attendance.

i. Eliminating the Gap Initiative

The department acted in September 2013 to provide more support to school jurisdictions that continued to have a significant gap between FNMI and non-FNMI student results. The department used its achievement results data to analyze the top five and lowest five provincial school jurisdictions on measures of achievement test and diploma exam participation and results.

The department identified 24 school jurisdictions, including the division, for further support and intervention. The department communicated with each superintendent, reinforcing the department's commitment to Goal 2 of the Ministry Business Plan (the achievement gap between FNMI students and all other students is eliminated) and asking superintendents to meet with department staff to discuss FNMI student performance using available data. The desire was for the school jurisdictions to develop local action plans with greater accountability for results.

The division was included in the initial communication for this initiative, but to date there has been only limited action or follow up. The department did not provide specific results reporting to the division as it did for other jurisdictions.

The department's commitment in rolling out this initiative was "to ensure your needs and challenges [the divisions'] are understood and to offer the support and resources possible from the department to enable the implementation of local action plans that will address the achievement gap." There is no documentation of discussions by the department and division on eliminating the gap and no action plan has been implemented. The department and division indicated that when they discussed the initiative, they decided that all efforts taken in the division are designed to improve student outcomes, so no specific efforts were required relative to the eliminating the gap initiative. The department has said it will follow up more diligently this year. We would have expected a more concerted effort by the department to support the division in developing and implementing a local action plan.

ii. Every Student Counts—Keeping Kids in School Report Project

The department concluded a two-year project in June 2014 and reported on student attendance and truancy. The report was designed to provide leadership and support to the department, stakeholders and school jurisdictions. The report was based on surveys and interviews with 16 Alberta school jurisdictions with low dropout rates, positive high school completion rates and minimal referrals to the Attendance Board. Interviews were conducted with school staff, school superintendents, members of the Attendance Board and student focus groups. The report summarizes relevant research and provides strategies to improve student attendance.

The report is available online for school jurisdictions to use as a tool in improving student attendance. Despite known attendance issues, the department did not work with the division to apply the report to help improve attendance and school completion in the division. The department worked on the attendance improvement project for two years without involving the division, which shows a lack of communication and collaboration towards common objectives.

iii. Community Based Aboriginal Teacher Education Program

A common barrier to division students regularly attending school is a lack of local educators who understand the FNMI community and want to stay in the community over the long term. In 2009 the department introduced a pilot project to increase the number of FNMI teachers and support staff in northern Alberta. The program provided funding to education para-professionals working in remote northern schools while completing a Bachelor of Education degree through a distance-delivery model—without leaving their communities. The program was a collaborative effort between northern Alberta post-secondary institutions and the University of Alberta's Aboriginal Teacher Education Program.

The initial program had participants from seven northern and two urban school jurisdictions including Northland School Division. In exchange for a four-year return of service, participants were paid a portion of their salary and benefits, and were reimbursed for tuition, books and fees. Funding was cost-shared by the department and participating school jurisdictions. The first graduates began teaching for the 2013–2014 school year. The 20 new teachers that began in the division are currently in their second year of teaching.[16] One was awarded the Alberta School Board Association's award for best new teacher in northern Alberta.

The department did not continue the program beyond the pilot project after concluding the program was too expensive. The department is assessing the results and discussing alternatives for future programming.

Implications and risks if recommendation not implemented

Without appropriate oversight by the department, the division's likelihood of success is reduced and the risk of failing another generation of the division's children increases.

Monitoring attendance

Background

The *School Act* requires students aged 6 to 16 attend school regularly and on time. It also defines excusable absences as "sickness or other unavoidable cause", religious holidays, suspensions or expulsions, or as prescribed by the board or the minister.[17] The superintendent is the attendance officer for the division.[18] The division's attendance procedure[19] requires the principal to keep an accurate record of student attendance for every student in the school.

Teachers in elementary and junior high schools take attendance each morning and afternoon; those in high school take attendance for each block or period. Teachers have to tell parents by phone call or a note when attendance becomes a concern. Teachers also have to notify the principal when a student misses 20 per cent of the days in one month—typically about four days a month. The principal has to work with the teacher, community liaison worker, parent/guardian and/or the Local School Board Committee to improve the student's attendance.

---

[16] Nineteen of the teachers are employed in Northland School Division and one has transferred to a First Nation school located in the area.

[17] *The School Act, S 13(5)*

[18] The attendance officer is defined in the *School Act* as the superintendent or any other person designated by the board as an attendance officer. Section 14(1) of the Act outlines the authorities of the attendance officer to enforce attendance.

[19] NSD attendance procedure 301(1)

If local efforts fail, the principal has to notify the superintendent, who has to inform the parents or guardians, encourage improvement and tell them of their responsibilities. If these efforts don't work, the superintendent can notify the Attendance Board or other appropriate authority.

The division uses a software program to collect and report information on students, including student attendance. This program allows web-based access for both the schools and the division to share and report student information.

School administration has to print attendance reports monthly, by class, and forward them to the division's central office. School principals report monthly attendance to Local School Board Committees and the Superintendent reports monthly attendance to the Official Trustee.

RECOMMENDATION 3: MONITOR AND ENFORCE STUDENT ATTENDANCE

We recommend that Northland School Division improve its guidance and procedures for schools to:

- consistently record and monitor student attendance
- benchmark acceptable attendance levels
- manage and follow up on non-attendance

Criteria: the standards for our audit

The division should have systems to assess if it is improving student attendance, including:

- establishing and ensuring consistent application of attendance procedures and data collection in its schools
- having appropriate policies and procedures to ensure its schools meet attendance-monitoring requirements

Our audit findings

KEY FINDINGS

- Non-attendance is accepted as the status quo at the division and its schools. Oversight of improving attendance results is deficient.
- Neither school administrators nor the division monitor or enforce compliance with the attendance policy requirements.
- Reasons for non-attendance and follow-up actions are often not documented.
- Schools have inadequate processes and controls to ensure attendance data is reliable; the division has not provided adequate guidance or training.
- Schools' monthly reporting of attendance to the division is too highly summarized to be useful.

We observed procedures for recording and monitoring attendance in the nine schools. Overall, problems involve a lack of consistency in procedures to take attendance, limitations in reporting attendance, and poor monitoring of student absences. Neither the schools we visited nor the division's central office had documented processes to take, record, monitor or report attendance. Nor did they have a software user manual.

Oversight of these processes has failed at the division and schools. Non-attendance is accepted as the status quo in schools and by the division. Higher expectations and accountability for attendance results are required. Also required is action to understand and document the reasons that students are absent and the actions to support and encourage those students to come to school.

Attendance procedure

The division's attendance procedure has specific requirements to identify students who do not attend school and provide guidance on what to do. The procedure is prescriptive in the actions to be taken, but it is not specific enough to ensure consistent enforcement by the division. For example, teachers are to "make every reasonable effort to inform the parent as soon as a student's attendance becomes a concern." The procedure does not define "reasonable effort" or "becomes a concern".

During our audit, the division began to review its attendance practices. It will consider revisions to its attendance procedure as part of this process.

Apart from the terminology problems, many school administrators and teachers we interviewed did not know the requirements. We saw no documentation that the schools or the division enforced compliance with them.

Student attendance data

Recording attendance

Teachers used various methods to record daily attendance data in the attendance software system. Schools have automated this system so teachers enter information directly into the database at the start of class. But most teachers we interviewed do not always enter data daily because of the demands of classroom management. They use a paper copy or another manual process. Because the system is not designed for this, there are no controls for review of manual attendance records or for retention of these documents. Discrepancies existed between the manual attendance sheets we reviewed and the information recorded in the attendance tracking system.

Some teachers or school administrators do not maintain manual attendance records past the current term. Whether teachers entered attendance into the program immediately or later, there are no processes to review or verify the data.

System controls

Systems controls are weak. The system defaults to students being present until a teacher logs into the system and enters actual attendance. Not all administrators we interviewed knew of system-generated triggers that can identify the difference between perfect attendance for the day and attendance data simply not being entered.

School administrators send monthly attendance reports to the division on the last day of each month. Teachers said this is when attendance for the month is caught up if necessary. There are no controls to prevent staff from entering or revising data for previous days.

Using attendance codes

Codes can be set up in the attendance software program to track reasons for absences. Some schools used a basic coding structure of present, late or absent. Others used various absence codes such as excused, unexcused, sick, medical, no bus or school closure. Neither individual schools nor the division has written guidelines for the use or definitions of codes, so there was no consistency in the coding within a school or between schools. If all schools used a standard set of codes and applied them consistently, the division would have improved data for analysis.

Missing data

At the end of the school year school administrators have to close the attendance data file. But in some cases the year-end close was not performed correctly, so archived prior-year attendance data was over-written and, therefore, lost.

There were also inconsistencies in handling student transfers out of the division. In some cases, student attendance records were deleted rather than marked as inactive, resulting in the student's attendance record being destroyed.

Review and guidance by the division

The division does not have review processes at the school or division level to ensure attendance data are accurately recorded. There is no results analysis of monthly attendance registers or oversight of school recording and monitoring processes.

Support and training by the division

Teachers and school staff we interviewed had varying levels of awareness of the capabilities of the software program. Most indicated that if they received training, it did not meet their needs.

The division does not have a full-time resource person with expertise in the software program to support school or central office staff. The division contracts with a part time person who knows the software. The lack of organizational expertise in the software poses a significant risk to the division's ability to record and monitor attendance.

The process weaknesses we identified represent missed opportunities to provide reliable and timely data to explain attendance rates and to understand reasons for non-attendance. Weak controls around the input of attendance data and the detection of non-entry of attendance data increase the risk of inaccuracy, which may lead to the wrong decisions and a lack of action to improve attendance.

Monitoring student attendance

Following up on non-attendance

Teachers have to identify when attendance becomes a concern and contact a student's parent or guardian. In some schools, community liaison or administrative staff help teachers do this. Communication with parents or guardians or other follow-up actions was typically not documented so we could not observe the nature and extent of intervention. Many teachers could not give details of documentation on their follow up of student absences.

Some teachers we interviewed did not know they had to inform the principal when student attendance becomes unacceptable or students are absent more than 20 per cent of days in one month. The schools had no formal reporting mechanisms to ensure this reporting occurred. Teachers would just tell the principal.

Principals must work with the teacher, community liaison worker, parent/guardian, and/or the Local School Board Committee to improve a student's attendance. Again, these processes are informal and often not documented. Intervention was reported to consist of home visits and informal conversations with parents or guardians. Formal letters and other communication were rare. Because of the lack of documentation, school principals could not show the actions taken with specific students or report on results.

High school students absent for more than 30 per cent of a class can receive credit for that class only after a special review by the principal or superintendent. This requirement was inconsistently enforced. In cases where performance reviews reportedly took place, documentation was unavailable.

The division's policy requires administrators to tell the superintendent where local efforts have failed to improve a student's chronic non-attendance. However, administrators have not told the superintendent of any such students. The superintendent has not followed up with administrators even though monthly attendance reports indicate many students are over the non-attendance threshold.

Monthly attendance reporting

School administrators give monthly attendance reports to the division's central office. Reports include attendance registers by student for each grade. Division staff prepare a summary report for the superintendent with the average attendance percentage for each school by grades K to 3, 4 to 6, 7 to 9, and 10 to 12.

This highly summarized reporting makes it hard to identify potential anomalies or inaccuracies in the reporting. It does not have the detail to identify students at risk due to chronic non-attendance. More detailed reporting is needed to monitor school administrators' compliance with the division's attendance policy.

Enforcing attendance

Individual schools and the division have not enforced attendance requirements. Central office staff have been involved in student suspensions and expulsion hearings, but have not been asked and have not intervened to help schools with students whose attendance has not improved despite local efforts.

Although the superintendent is the designated attendance officer responsible to ensure students attend school, the superintendent has not referred any students to the Attendance Board.[20] The Attendance Board cannot enforce rules for federally funded First Nations students, so the board's processes cannot be applied to many of the division's students. Division staff also expressed concerns that the Attendance Board's quasi-judicial process is unsuitable for communities that still distrust the education system because of residential schools and the Sixties Scoop.[21]

The department has guidance on steps for school jurisdictions to take before requesting a hearing with the Attendance Board. These include identifying factors contributing to the student's non-attendance, steps taken to monitor attendance, development of plans and strategies for improvement, and documenting results of these actions. The division's processes do not create the documentation required to request a hearing.

The division must develop a more culturally responsive approach to encourage and support good attendance and to enforce compulsory attendance in cases where this is the last resort. In 2006 through 2008 the Edmonton Catholic School Board and Edmonton Public School Board ran a pilot partnership with the Centre for Race and Culture using attendance circles as a more culturally appropriate alternative to the Attendance Board. Results suggest the approach worked.[22] Schools in Fort McMurray

[20] Department records indicate that since 2009, Northland has initiated an attendance board hearing for one student.

[21] The term Sixties Scoop refers to the removal of many Aboriginal children from their families into the child welfare system between 1960 and the mid-1980s, in most cases without the consent of their families or bands. http://indigenousfoundations.arts.ubc.ca/home/government-policy/sixties-scoop.html

[22] Aboriginal Attendance Circle Evaluation Report, Centre for Race and Culture, June 2013.

were successful in working with local Elders to establish an Attendance Circle to intervene with students with attendance problems.[23]

The department and the division have an opportunity to show leadership in this area by drawing upon effective models to develop an innovative, workable alternative to support student attendance in cases where enforcement is necessary.

Implications and risks if recommendation not implemented

Without systematic monitoring and reporting on attendance, the division will not consistently identify and support those students with chronic non-attendance.

[23] First Nations, Métis and Inuit Education: Promising Practices in Fort McMurray, November 2013, Alberta Education, page 4.

Appendix A

SUMMARY OF RECURRING RECOMMENDATIONS

Summary of key reports and studies

The Northland School Division Inquiry Team Report in November 2010 was not the first such report. Since the division's inception in 1960, there has been a major study or report about once every decade:

- Report of the Northland School Division Study Committee (December 1969)
- Report of the Northland School Division Study Group to the Minister of Education (July 1975)
- Report of the Northland School Division Investigation Committee (October 1981)
- Alternative Structures for Governance of Northland School Division #61: A Discussion Paper (Fall 1982)
- Early School Leavers in Northern Alberta: Workshop Report (June 1984)
- Report of the Northland School Division Study Team (1996)

Examples of recurring recommendations

The Inquiry Team Report identified 10 recommendations that we recurred in these reports and were still relevant in 2010. Four years after the release of the inquiry report, they are still relevant today, yet most have not been adequately dealt with:

1. The need to adapt the curriculum to the cultural background of the student population.
2. The need for more extensive teacher orientation with more focus on developing understanding of the cultural backgrounds of the students, with at least some of the orientation occurring at the community level.
3. The need for improved internal communications.
4. The need for parenting programs and for a more intensive pre-school learning experience for most students.
5. The need to build closer relationships among the schools, the parents and the communities and for schools to be more of a "community centre".
6. The need for improved teacher housing that allows for reasonable rental rates in the context of remote or isolated northern communities.
7. The need for the continued existence of a unique school system and for it to have a philosophy, mission and vision that recognizes its uniqueness, especially as regards the cultural background of the student population.
8. The need for the school system to have higher levels of support from other social agencies to assist in addressing challenges such as low student attendance rates.
9. The need for a governance structure that supports the principle of local control based on a democratic and representative electoral process while recognizing the need for an ongoing educative support system that enables governors to implement visionary, policy driven practices and avoid micro-management.
10. The need to capitalize on the potential of cooperation with post-secondary institutions that have a presence in the communities to deliver more effective and efficient senior high school programs.

Appendix B

COMMUNITY CONSULTATIONS

To better understand what is working and not working for families in the division, we held meetings in two communities, Wabasca—Desmarais and Gift Lake. We met with parents and caregivers, grandparents, students, former students, teachers, administrators, local school board committee members, Elders and other community leaders.

In each community we were greeted by groups interested in improving the education system for their students. They discussed what is and is not working and what could best improve attendance.

We are appreciative of the people who met with us and shared their time to help us understand their communities. We would like to thank those at Gift Lake School, Mistassiniy School, St. Theresa School, Career Pathways School (Outreach), Oski Pasikoniwew Kamik School, Northern Lakes College Wabasca Campus, Gift Lake Métis Settlement Office, Bigstone Cree Nation Administration Office and the Municipal District of Opportunity No. 17 Administration Office where we held meetings.

What did we hear from the community?
The over-riding message we heard from the communities was the critical importance of positive relationships. Some of the factors the community identified as impacting attendance related to areas beyond the division's or the education system's responsibility. The community recognized this.

All parties involved expressed a desire to improve the system for the benefit of the children and young people. They recognized that efforts by school staff and administrators, families and communities, First Nations, Métis and local government leadership, the division's central office, the department, industry and other agencies and organizations must be aligned and coordinated and focused on actions leading to student success. They described a holistic approach to supporting students.

The following is how the groups we met described a positive future for attendance within their communities:

- Values—*encouraging, motivating.* A positive future for attendance would include building self-esteem in the communities' students; positive support from peers, family, teachers and study groups; education that is geared to student needs, that understands and accepts diversity; and respects Cree culture and language. Successes are celebrated by showing pride in students' work and acknowledging the division's aspiring artists. The importance of education is shared and the communities trust the schools to nurture their children.
- Programming—the communities wanted the division's education to be at par with the rest of the province; with less upgrading required. Programming needs for special needs, higher level math and science, quality options, Aboriginal studies, sports and field trips would be met.
- Environment—*caring, supporting.* The communities described a welcoming and safe environment for its schools. Improved facilities with well-maintained spaces for elementary, middle school and high school students. This would include vocational training and outreach options, supported by strong technology, transportation and improved accessibility. Appropriate levels of support staff, administration and specialists are available.

- Funding—Many groups expressed a need for sustainable funding that would allow successful programs to continue, as there was a sense that good, positive programs were often discontinued as short-term grants or other funding ceased. Areas of need included libraries, sports equipment and training, additional programming options, afterschool care and daycare in high schools.
- Partnerships—*uniting, strengthening.* Based on the idea that team work, partnerships and shared resources will be important for a positive future for attendance. Health and wellness resources, mental health supports and social services supporting community based schools were identified. Volunteers providing fundraising, supervision and assistance with after school programs; industry working with apprenticeships, mentoring, environmental stewardship and role modeling.
- Healing—*cultural sensitivity, role modeling.* The communities envisioned a positive future where the cycle of negativity is broken. The link between the school board and community is re-established and the community voice is heard.

Energy—Alberta Energy Regulator—Systems to Regulate Pipeline Safety and Reliability in Alberta

SUMMARY

Pipelines are an essential component of the energy industry in Alberta. The primary responsibility for maintaining safe and reliable pipelines rests with their operators, who directly influence the condition and operation of a pipeline throughout its lifecycle. The Alberta Energy Regulator's (AER) role is to ensure pipeline operators comply with regulatory requirements, with public safety and the environment as their priority. Even an effective regulator cannot eliminate the risk of pipeline incidents, but what a regulator can do is have well-designed and effective systems to appropriately oversee industry operations and reduce the risk of incidents occurring. In June 2013, the AER began operating as a full lifecycle[1] energy regulator. The AER faced many challenges inherent with this transition—incorporating new people and processes, implementing a new oversight model, and making improvements to existing systems—all while trying to maintain the quality of existing regulatory processes. We believe our audit of AER's systems for regulating pipelines provides useful recommendations to assist in this ongoing transition and continuous improvement.

What we examined

To determine whether the AER has adequate systems to regulate the operation of pipelines in Alberta, we focused on activities that are essential for regulatory oversight:

- the risk management system to identify, assess and manage pipeline risks
- measuring performance, assessing results, and identifying learnings for improvement
- systems for collecting information from pipeline operators
- monitoring and enforcing of pipeline operator regulatory obligations
- responding to, investigating and reporting on pipeline critical incidents

What we found

The AER has well-functioning systems to regulate pipeline operations in Alberta. Albertans can be assured that the regulator is adequately performing its function of overseeing pipeline safety and reliability. Nonetheless, with the AER's goal to be a leading regulator, coupled with greater expectations and scrutiny on the AER's and industry performance, continuous improvement is necessary. Therefore, we identified a number of areas where the AER can make improvements:

- The enterprise risk management system is still under development. There isn't a clear link between the risk information and resource allocation activities that will help AER reach its targets.
- A skills gap analysis of pipeline staff has not been completed and a formal training program is not in place.
- A primary target of reducing incidents 4% by 2016 is in place, but this target does not encapsulate the severity of incidents. Overall, measures and targets could be enhanced and better aligned with individual staff performance goals.

[1] The AER is responsible for regulating all of the application, construction, production, abandonment, and reclamation activities in the energy sector. Previously, some elements of these regulatory functions were carried out by other government organizations.

- The AER collects a lot of data from pipeline operators, but it has not completed an evaluation of its present and future data needs to confirm it has all the information it requires to better regulate pipelines in an evolving industry.
- While the response and investigation of critical incidents are performed well, the AER did not go as far as it could have in highlighting contributing factors and sharing these lessons learned with industry.
- Pipeline operator integrity management programs[2] are a key component of keeping product safely in the pipeline. The AER does not have a defined process to evaluate the effectiveness of these programs.

During the course of the audit, we also identified a number of positive and noteworthy practices that the AER employs:

- The emergency response process in each of the five pipeline critical incidents we reviewed was strong and well-documented.
- The AER has a process to promptly post details of incidents that meet certain criteria.[3] Such a process offers transparent and timely information to the general public and the industry.
- Based on past operator performance, the AER identified those that may pose a greater risk and met with their senior management to promote pipeline safety practices.
- The AER carried out its enforcement activities as stipulated by the rules and regulations. With the new enforcement framework that came into effect in 2014, the AER has more tools and powers; as such, continued operational effectiveness of this system will be critical.

Perhaps most importantly, through our interactions with AER staff, we observed a strong commitment to what the AER is trying to achieve. We also observed that the AER began the process of responding to our recommendations and findings while the audit was still underway – this willingness to improve will serve the AER well in reaching its goals.

What needs to be done

We made six recommendations to the AER to achieve continually better results from its pipeline regulatory systems:

- use its risk management activities to make informed decisions on allocating resources and determine the nature and extent of activities to oversee pipeline operations
- complete a skills gap analysis and formalize a training program for its core pipeline staff
- improve measures to assess pipeline regulatory and industry performance
- expand its analysis of incident contributing factors beyond primary causes and share lessons learned with industry and operators
- determine what data it needs from pipeline operators
- develop an approach to cost effectively assess integrity and safety and loss management[4] systems

Why this is important to Albertans

Pipelines are a critical component of the energy industry in Alberta and Albertans expect pipelines to be safe and reliable as well as to deliver economic benefits. Albertans expect the AER to have well-functioning regulatory systems to oversee the energy industry and ensure its pipeline operators act responsibly. Protecting public safety and the environment is an integral responsibility of the energy industry and the AER.

---

[2] An integrity program is a documented process that pipeline operators would use to specify practices to ensure environmentally responsible, safe and reliable operation of the pipeline system.

[3] http://www.aer.ca/compliance-and-enforcement/incident-reporting

[4] The safety and loss management system is a complex system operating companies would design for the protection of people, the environment and property. The approach emphasizes the need to look at an overall process or system, including the combination of human, organizational, technical and environmental factors, rather than individual safety problems.

AUDIT OBJECTIVE AND SCOPE

Our audit objective was to assess whether the AER has adequate regulatory systems to help ensure the safe and reliable operation of the pipeline systems it oversees.

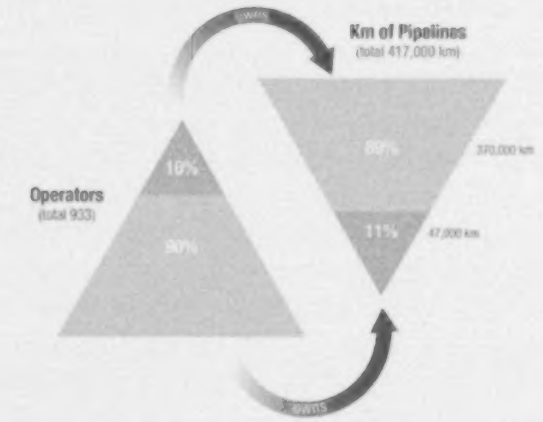
Our scope included the AER's core pipeline activities: surveillance, inspection, compliance, incident response and regulatory enforcement, as well as the foundational components of risk management and performance measurement. Our audit did not include the AER's systems for pipeline applications and abandonment. We did not assess the merits of the regulation that gives the AER the authority to regulate pipelines within Alberta. The government contracted a third party to assess the sufficiency of the pipeline safety regulation[5] and prepare a report with recommendations.

As part of our audit, we met with and interviewed staff at various field offices and also accompanied AER inspectors to observe their inspections at selected operator sites. We also interviewed a variety of external parties and stakeholders about their interaction with the AER and the overall regulatory systems for pipelines. We engaged an expert to assist us during the course of the audit.

We conducted our field work between April and September 2014 and we substantially completed our audit on November 30, 2014. Our audit was done in accordance with the *Auditor General Act* and the standards for assurance engagements set by the Chartered Professional Accountants of Canada.

BACKGROUND

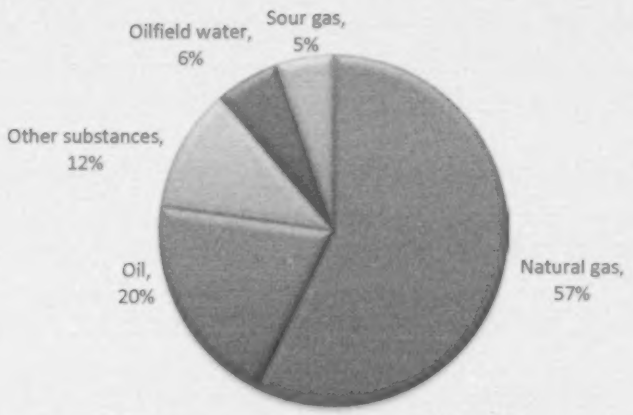
Pipelines are used to transport a variety of liquids and gases. They are often categorized as one of the safest, most efficient and reliable ways to move energy related products over long distances. In Alberta, the AER regulates about 417,000 kilometres of pipeline used to transport crude oil, bitumen, natural gas, sour gas, oil emulsion, and salt and fresh water. Ten per cent of the operators own 89 per cent of the 417,000 kilometres pipelines the AER regulates across Alberta (see figure below).



[5] Alberta Pipeline Safety Review prepared by Group 10 Engineering for ERCB, December 7, 2012. http://www.energy.alberta.ca/Org/pdfs/PSRfinalReportNoApp.pdf

Pipelines are commonly made by welding together steel pipes in varying lengths, diameters, wall thicknesses and buried depths. More recently the industry has also used composite materials for pipelines. Compressors and pumps maintain the flow of liquids and gases in the pipelines, while valves control the flow. Most pipelines in Alberta are small gathering and feeder lines that carry production from individual wells to nearby processing facilities. The remaining pipelines are large transmission lines that carry oil and natural gas to distribution points within the province, to other provinces and internationally (Appendix A).

The following figure indicates the percentage of products that are transported using pipelines in Alberta.[6]



Significance of pipelines in Alberta

Oil and natural gas are an integral part of Alberta's economy. Pipelines are essential for carrying oil and gas from the wells and mines where they originate to storage, processing facilities and refineries, as well as to residential, commercial and industrial users. Increased energy production requires a corresponding increase in pipeline capacity. In effect, putting a limit on pipeline infrastructure would also limit growth in the energy sector and Alberta's economy. There are other methods, such as trucking and rail, to transport liquid energy products; however, pipelines are the most common method of transporting oil and liquids and are the exclusive method for natural gas.

Energy pipelines carry materials that can cause environmental damage and health and safety issues. In recent years, significant pipeline failures have also led to increased public concerns over the safe operation of pipelines. Although the probability of a single failure is low, each critical event has a potential for high impact and consequence to public safety and the environment. As Alberta's pipeline capacity has continued to grow, so has the attention placed on the industry's ability to operate with due care for the environment, health and safety. The prevalence and importance of pipelines, the large volumes transported and the associated risks make it necessary for Alberta to operate a strong regulatory environment to oversee pipeline operators.

[6] Alberta Energy Regulator, Report 2013-B, Pipeline Performance in Alberta, 1990-2012, page 9.

Key risks related to pipeline failures

A number of factors impact pipeline regulatory processes and the risks related to pipelines:

- The provincial pipeline network has doubled in kilometres since 1996.[7]
- Alberta's pipeline infrastructure is aging.
- Pipelines are subject to internal and external corrosion.
- Public awareness of environmental and safety risks is growing, while tolerance for risk is not.
- Volatile energy prices may impact operator preventative maintenance.

The AER's 2012 Field Operations Provincial Summary reported 447 high risk compliance concerns in seven inspection categories. Pipeline operations accounted for 39 per cent of these compliance problems. Older infrastructure, if not properly maintained, contributes to the high probability of failure; 30 per cent of pipelines in Alberta were built more than 25 years ago (Appendix B).

Pipeline failures can be caused by construction damage, damage by individuals, earth movements, internal and external corrosion, joint failure, overpressure and operator error. These failures include leaking (a pipeline is losing product but continues to operate) and rupture (a pipeline cannot continue to operate). AER data shows that the main cause of pipeline failure is corrosion:

- Over 67 per cent of pipeline failures are due to internal and external corrosion.[8]
- 86 per cent of Alberta's pipelines are made of steel, which is corrosion prone.[9]

Critical incidents are matters that warrant immediate action by pipeline operators and the regulator due to the potential of significant public and environmental impacts. See Appendix C for examples of pipeline-related incidents.

Pipeline failure resulting in a puncture, rupture or leak can have significant environmental and public safety risks. The key risks include:

- **environment risks**—harm to plants and animals, soil and water quality
- **public safety risks**—explosions, drinking water contamination and damage to public lands
- **reputational risk**—reduced public confidence in the government's regulatory processes and the oil and gas industry's ability to operate responsibly; increased scrutiny and criticism of Alberta's approach to its natural resources
- **economic risk**—more complicated negotiations to approve and build the pipeline necessary to move more energy products to broader markets
- **financial risk**—impact on production and ability to deliver petroleum; cost of repair and clean up; litigation due to property damage and injuries; costly delays in approving and building pipelines

Responsibility for safe and reliable operation of pipelines in Alberta

Operators

The responsibility for safe and reliable pipeline operations resides with industry and operators. Safety, compliance, security and cost effectiveness are all critical considerations for operators. Operators need to have systems in place, including management control and integrity management systems, to ensure pipelines are operating safely and reliably.

---

[7] Ibid.

[8] Alberta Energy Regulator, Report 2013-B, Pipeline Performance in Alberta, 1990-2012, page 39.

[9] Alberta Energy Regulator, Report 2013-B, Pipeline Performance in Alberta, 1990-2012, page iv.

Regulatory agencies

As a quasi-judicial agency[10] of the Government of Alberta, the AER regulates and oversees oil and gas development activities throughout the province, including pipelines. Pipeline operators must comply with the government's *Pipeline Act* and regulation and the AER monitors and enforces their compliance.

The AER is responsible for regulating the lifecycle of pipeline systems, from design and construction to operations, maintenance and abandonment. A federal organization, the National Energy Board, regulates interprovincial and international pipelines (for example the proposed Northern Gateway and Energy East pipelines). The Alberta Utilities Commission regulates natural gas transmission lines within the utility sector. The AUC has an arrangement with the AER to carry out some responsibilities on AUC's behalf: surveillance and inspections, incident response, and failure investigations on the natural gas transmission lines.

Alberta's regulatory framework

The key elements supporting the Government of Alberta's regulatory framework are:

- *Pipeline Act* and regulation—This gives the AER the authority to regulate oil and gas pipelines that operate solely within Alberta's boundaries. Operators are to develop, operate and abandon pipelines used for energy development as prescribed in the *Act* and the pipeline regulation.
- AER directives, manuals and bulletins[11]
- Canadian Standards Association standard for pipelines—An integral part of the AER's regulatory program is checking for compliance with a national standard, called *CSA* Standard Z662-11 Oil and gas pipeline systems,[12] developed by the Canadian Standards Association. This standard sets out minimum requirements in largely prescriptive terms to cover more than pipeline design. It encompasses construction and the safe operation of pipelines, including the requirement for operators to develop and maintain effective integrity management programs and safety and loss management systems.

In 2012 the government commissioned a review of Alberta's pipeline regulatory requirements and framework.[13] Alberta's approach was compared to those in similar jurisdictions in Canada and beyond Canada's borders. The review concluded that Alberta's regulator provided the most thorough overall regulatory regime of all assessed Canadian jurisdictions.

Of the pipeline inventory across the province of Alberta, the AER regulates 417,000 kilometres of pipelines; NEB and AUC regulate 30,000 and 11,500 kilometres, respectively. The AER regulates about 900 operators for which it has issued licences to construct and operate pipelines. Most licensees in Alberta are oil and gas producers that operate feeder lines. In many cases, pipeline systems are not the core assets or the primary focus of the operator. Pipeline companies that operate transmission lines represent a smaller portion of licensed operators.

---

[10] A quasi-judicial agency ascertains facts, holds hearings, weighs evidence, makes conclusions from facts, and exercises discretion of a judicial nature. Its adjudicative functions are performed outside of a court setting.

[11] http://www.aer.ca/rules-and-regulations/by-topic/pipelines

[12] The CSA Z662 standard is a consensus document reflecting the viewpoints of operators, regulators, contractors and consultants.

[13] Alberta Pipeline Safety Review prepared by Group10 Engineering for ERCB, December 7, 2012. http://www.energy.alberta.ca/Org/pdfs/PSRfinalReportNoApp.pdf

The Alberta Energy Regulator's operations and challenge

In June 2013, the *Responsible Energy Development Act* established the AER as the regulator of Alberta's energy sector. The AER took over regulatory functions from the Energy Resources Conservation Board (ERCB) and energy development regulatory functions from the Ministry of Environment and Sustainable Resource Development (ESRD). The AER became Alberta's single regulator of energy development—from application and exploration, to construction and development, to abandonment, reclamation and remediation.

The AER oversees a wide variety of pipeline types of varying size, complexity and age. The pipeline licensees also reflect this disparity in terms of their size and technical ability. This variety presents a considerable challenge to the AER both in assessing the level of resources to be applied and in taking a consistent approach to the oversight of pipeline operators. A "one size fits all" solution is unworkable.

Management fulfills the AER's oversight responsibility for pipelines primarily through its Environment and Operational Performance branch (EOP), which includes:

- operations, emergency response and investigation group—responds to pipeline emergencies and investigates failures
- enforcement and surveillance group—inspects pipeline construction, operations and incident sites; monitors pipeline operations and incident responses
- operational staff at nine field centres located across the province—respond promptly to incidents

The AER receives and responds to all public complaints about industry activities. AER field surveillance staff log and investigate these complaints. See Appendix B for a trend analysis of public concerns from 2008 to 2012.

FINDINGS AND RECOMMENDATIONS

Risk management of pipeline regulatory activities

Background

The AER's activities have to keep pace with the energy industry and respond to changing risks that may threaten public safety and the environment. Effective risk management is essential for the AER to achieve its regulatory objectives in this complex environment. In essence, risk management is a continuous, proactive process for:

- assessing the risk of uncertain outcomes
- ranking risks based on likelihood and potential impact
- preventing and reducing impact of incidents

The AER must manage risk at an enterprise level, as well as at operational levels directly related to pipeline safety. To fulfill its oversight role, the AER's board must receive regular and meaningful information from management. For example, regular risk management reports are essential to help the board understand whether the regulator's risk mitigation action plans are in line with its risk tolerance.

Operationally, the AER's compliance and enforcement programs have a high focus on risk. The success of the regulator's oversight through these programs depends on the AER having sufficient, well-trained and highly experienced staff to carry out their regulatory functions. The AER entrusts these staff to make critical judgments when performing inspections and investigations.

RECOMMENDATION 4: USE RISK MANAGEMENT ACTIVITIES TO MAKE INFORMED DECISIONS

We recommend that the Alberta Energy Regulator use its risk management activities to make informed decisions on allocating resources and determine the nature and extent of activities to oversee pipelines.

RECOMMENDATION 5: FORMALIZE TRAINING PROGRAM FOR CORE PIPELINE STAFF

We recommend that the Alberta Energy Regulator complete a skills gap analysis and formalize a training program for its core pipeline staff.

Criteria: the standards for our audit

The AER should use a risk management system to identify, assess and manage risks in fulfilling its regulatory duties over pipelines. Management's decisions for allocating resources should reflect the AER's priorities for managing risk at the operational level, including the allocation of appropriate staff resources. The regulator should also have sufficient, well-trained and experienced staff to carry out pipeline regulatory functions.

Our audit findings

KEY FINDINGS

- The AER has not fully implemented its enterprise-wide risk management system.
- At an operational level, the AER lacks a formal process to fully assess the risks and its related resource requirements for various pipeline operational activities.
- The AER employs good practice by targeting certain non-routine operational risks as they arise.
- The system for ranking risks does not guide allocation of resources.
- The AER has not completed a skills gap analysis and does not have a formal training program for its core pipeline staff.

Risk management systems are being designed but are not yet fully implemented—The AER is in the process of developing the foundational components of an enterprise-wide risk management system. The AER has:

- compiled a corporate risk and opportunity register by seeking input from staff
- hired staff with risk management skills and experience
- set up a project team to support risk management activities
- identified four categories of risk in its corporate risk register: regulatory, corporate, strategic and governance

The AER's board also identified a number of risks, which it shared with the risk project team. In the fall of 2014, the team presented the board with findings on the key strategic risks and gave the board an overview of risk criteria and risk evaluation. However, the regulator has not yet fully developed its risk mitigation plans or defined its risk tolerance for the core areas of its regulatory functions, including pipelines. Regulatory oversight of pipelines is documented as one of the AER's high risk areas.

The regulator's oil and gas sector group completed a sector risk register, identifying pipeline related risks and rating those risks. Given the early stage of development of the risk management system, we could not see a clear link from the corporate risk activities to operational planning, such as a link between risks and resource allocation. Furthermore, formal risk reports that include reporting of pipeline risks to senior management and the board have not been developed.

The AER does not have a structured process to identify, rank and target key pipeline operational risks, and integrate them into the operational plan—Despite an enterprise risk management process that is in its early stages, the AER applies a certain degree of risk management at the operational level. This takes place mainly through routine and non-routine operational activities.

However, the AER has not completed a ranking and integration of risks in the following areas:

- proactive compared to reactive activities, to prioritize and align risks with regulatory compliance activities
- pipeline operational activities compared to managing risks in other regulatory areas
- incidents compared by volume of release and failure types, for example—All incidents are treated as equal in the AER's annual planning process.

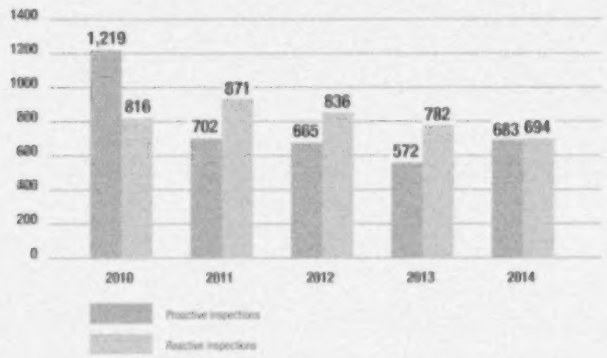
Routine activities—Proactive vs. reactive

The AER considers risks in two phases of its monitoring program, by:

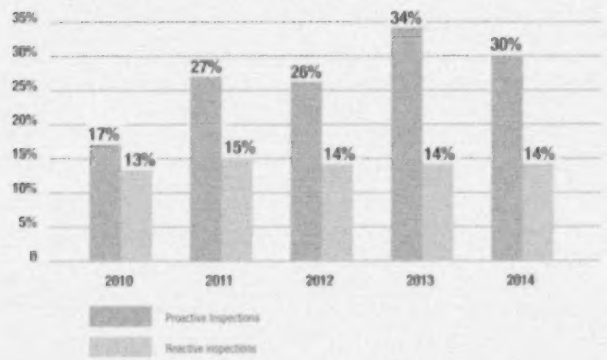
- viewing all incidents and complaints as a risk and responding to 100 per cent of the related occurrences—This illustrates a reactive approach to risk.
- using pipeline data and information to consider risk in its annual plans for proactive monitoring—This represents a proactive approach to risk.

The figures below summarize the two types of routine activities and their corresponding discoveries of non-compliance.[14]

Proactive vs. Reactive Inspections Over a 5 Year Period



Comparison of Proactive and Reactive Inspections Non-compliance Rate Over a 5 Year Period



[14] Annual period is from July 1 to June 30. Figures are compiled using pipeline data from the AER.

Proactive inspections discover higher non-compliance rates because they are generally broader and more exhaustive than reactive inspections. Of course, this also means that proactive inspections are more time consuming and costly. Proactive inspections can identify bad practices and "near misses" before they become critical. Reactive inspections have to be completed for incidents and complaints. As a result, reactive inspections take priority over proactive inspections in the allocation of resources. To get the most value from its regulatory work and appropriately respond to assessed risks, the AER should also determine an appropriate level of funding and resources for proactive activities.

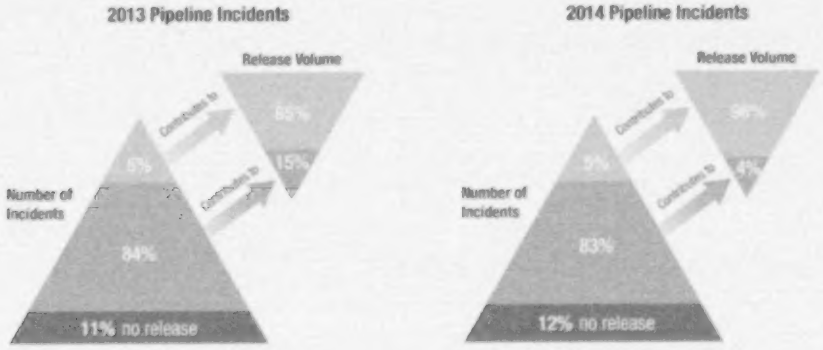
Our further analysis of the AER's proactive, detailed operation inspection program used data spanning the last five years. The figure below shows that at least half of the pipeline operators inspected by AER have one of more areas of non-compliance.[15]

AER field staff view detailed operation inspections as a value added activity because discoveries of non-compliance lead industry to take corrective action before incidents happen.

The AER does not integrate or prioritize its annual planning for proactive activities at the provincial level. On occasion, field centres provide each other with short-term help upon request. However, the AER has not integrated or prioritized various risks and activity levels of its nine field centres. Management has not set inspection sample sizes for each field centre to reflect the risks and industry activity level in the area and to ensure that the centre has enough resources for the identified risks. Each field centre has different risk levels and factors, including the type of operators, geography, type and age of pipes, and seasonal activity. Each AER field centre considers its inspectors' experience, activity level and understanding of risks in that area to select operators for detailed operation, construction and other inspections.

[15] Annual period is from July 1 to June 30. Figures are compiled using pipeline data from the AER.

Not all incidents have equal impact. The graph below shows the annual analysis of product releases from pipeline incidents for 2013 and 2014.[16] This further supports the importance of a proper risk ranking process in the AER's operational risk assessment.



Non-routine activities—Targeting specific risk areas

The AER follows good practices through its non-routine operational activities by identifying, targeting and responding to specific risks. However, the AER has not formalized its process for managing targeted risks, including the integration of these risks to the operational plan. These non-routine activities include:

- meeting with operators—An AER strategy is to meet with management of specific operators with past performance issues, to promote pipeline safety. This is a powerful tool to alter behaviours through relationship building, education, sharing best practices and enhancing management control systems.
- performing sweeps—Pipeline risks are attributable to various factors including weather, environment, geography, corrosion and the type of pipeline material. Operational areas across the province identify and target risks in varying degrees. For example, as a result of flood risk across Alberta in June 2013, staff in the Red Deer field centre swept the area through targeted inspections on operators that had lines crossing the Red Deer River.
- focusing on water crossings—The AER views pipelines with water crossing as a significant risk, which it has incorporated into its 2015 strategic plan. However, we were unable to see where risks at water crossings fit in the overall operational plan in comparison with other priorities. Management confirmed water crossing risks influence decisions at the proactive activity planning stage and for operational activities throughout the year. However, the ranking of this risk was not evident in the proactive operational planning process.

System for ranking risks does not guide allocation of resources—The AER could not demonstrate a clear link between the allocation of resources and the priority of risks identified. This process would support appropriate decisions and allow for better allocation of resources.

There is a high level of activity at various levels within the AER. However, we found no clear connection between its organizational goal to get the most value from its efforts and its approach to risk. A full risk assessment would enable the AER to maximize the benefits of its available resources, to support additional resource requirements as they occur, and to achieve the desired outcomes.

[16] Annual period is from July 1 to June 30. Figures are compiled using pipeline data from the AER.

The AER has not completed a skills gap analysis and does not have a formal training program for its core pipeline staff—Management has not completed a province-wide skills gap analysis, nor is there a coherent strategy in place to manage the training needs for core pipeline staff. This process would help management identify gaps that pose a risk to the AER objective, and should include a formal, comprehensive training plan and a plan to cover talent loss due to attrition.

Like many organizations in the energy sector, the AER has challenges in attracting and retaining both inspection and professional engineering staff. For example, we observed the loss of some very experienced pipeline inspection staff during the course of our audit. We recognize that employees who leave the AER to work for pipeline operators bring regulatory experience and will be keen to promote safe industry practices—a positive outcome. However, the industry's gain is the regulator's loss.

The pipeline CSA Z662 standard is an integral part of the AER's compliance program; all pipeline inspections rely on this standard. Yet we found, by means of a survey, that only five out of 16 inspectors and coordinators had received any form of training on the use and requirements of this standard. Only one of the six investigators had received training in the CSA Z662 standard, which includes a significant clause on safety and loss management systems. In addition, as the CSA Z662 standard continues to place more emphasis on safety and loss management systems, the AER will have to ensure skill sets and experience are in place to fulfill the CSA Z662 requirements. The AER should consider making it mandatory for staff to receive training in the use of the CSA Z662 standard, given its significance to the AER's compliance program.

Currently, training is done through mentorship by a more experienced inspector. As well, the inspectors and investigators self-identify their skills gaps on an ad hoc basis, through the AER's performance management and development assessment process. An informal approach to training can be a vulnerability both in terms of maintaining credibility with operators and ensuring continuity in essential monitoring and enforcement activities. These risks can best be managed through a formal training program for the regulator's core pipeline staff.

Training budgets, while available, appear to be fragmented and locally under the control of field centre managers. This level of discretion reflects the absence of a strategy for monitoring core pipeline staff training requirements. The small amount of funding available per person makes attendance at external courses difficult.

On a positive note, the AER recently developed a pipeline training manual. The overall manual content is good; however, the learning process appears to be self-directed and lacks a formal, in-depth assessment to verify that the material has been understood.

Implications and risks if recommendation not implemented

By not using risk management activities to inform operations activities, the AER risks not focusing on the highest impact activities and may not meet its pipeline regulatory requirements effectively.

Without a skills gap analysis and a formal and comprehensive training program for its core pipeline staff, the AER risks not having all the skilled staff necessary to carry out its current and planned activities.

Measuring performance of pipeline operations

Background

Performance measurement systems help decision makers evaluate whether outcomes are being achieved, assess what needs to change, and influence how to make changes and improve future plans. They are designed to evaluate the effectiveness of business plans. In the AER context, performance

measurement should focus on the effectiveness of monitoring and compliance oversight. Ideally, performance information should provide the basis for periodically evaluating the success of the AER's oversight of such things as pipeline operators' integrity related efforts and its own controls over risk mitigation.

The AER prepared a strategic plan for its priorities and goals for 2014–2017. Pipeline safety is an AER priority. The regulator's Environment and Operational Performance branch (EOP) is charged with achieving operators' compliance. Its operational plan for 2014–2015 sets out strategic outcomes, as well as performance measures and targets, for core business areas.

RECOMMENDATION 6: IDENTIFY PERFORMANCE MEASURES AND TARGETS

We recommend that the Alberta Energy Regulator identify suitable performance measures and targets for pipeline operations, assess the results obtained against those measures and targets, and use what it learns to continue improving pipeline performance.

Criteria: the standards for our audit

The AER should have performance measures and targets for pipeline operations, assess results against those measures and targets, and incorporate the outcomes to enhance future pipeline performance.

Our audit findings

KEY FINDINGS

- The AER has defined one, high level performance measure in its strategic plan: a four per cent reduction in pipeline incident rates by 2016. This measure does not consider the severity and risk of incidents; it treats all incidents as if they were the same.
- Not all AER pipeline business areas have quantifiable measures and targets.
- We found a weak correlation between individual goals and plans for working toward the four per cent reduction in pipeline incident rates.
- The AER can improve the analysis of its operational performance and should use what it learns from the evaluation to improve its programs.
- The AER has not clearly defined its internal and external reporting of performance information.

Pipeline target for reducing incidents does not consider severity or risk—We found a limited amount of information about the regulator's safety and integrity targets. One high level metric of reducing the rate of pipeline incidents four per cent by 2106 made no reference to how the measure relates to severity or risk reduction. We could not find documentation to explain how and why the AER decided on its four per cent target.

Not all pipeline areas have quantifiable measures and targets—The AER measures the amount of inspection activity. However, it has not set a quantifiable target for all such activity. Further, the EOP's operational plan mentions a target for the "number and type of pipeline incidents, including volumes and substances related" but does not set a measurable target. The measure reported for pipeline incidents is "reduce pipeline incident rate by two per cent compared to 2013–2014. Focus on inspections/audits and education efforts on high risk pipelines." This appeared more in the nature of a target than a specific performance measure; its link to strategies designed to achieve the desired outcomes was also unclear.

The Report 2013-B: Pipeline Performance in Alberta 1990–2012 provides a good baseline for measuring improvement in a number of areas. One difficulty in comparing the performance of AER licensees with those in other jurisdictions arises from a lack of consensus in defining what constitutes an incident. This presents an opportunity for the AER to take the lead with its peers in the Western Canada Regulatory

Forum, to establish clear definitions. The AER is also undertaking a review of performance measures through the "best in class" project it announced in November 2014.[17]

Individual employee goals are not strongly aligned with corporate goals—Through interviews with operational staff we learned that they were uncertain how their individual planned activity level would contribute to the four per cent reduction in the pipeline incident rate. While the AER has a strategic plan for achieving its objectives, there isn't a clear link to staff performance plans at all levels. We examined the Performance Management Development Assessment process the AER uses to document individual performance goals and provide supervisor support for achieving them. Based on a sample of assessments for pipeline staff, we could not see a strong alignment with corporate goals. Staff assessments referred to pipeline operational plans and activity levels that were virtually the same as in preceding years.

Data analysis to support decisions and performance measurement is not formalized—The EOP extracts and analyzes data for decision making, informally and as requested. To make informed decisions, management needs to rely on good data analysis to identify the trends and detect where the key risks lie. It is important that the data is sufficient and accurate at the granular level to support good decision making and measurement of performance. Our testing of inspection files found that inspection results are not consistently documented in the Field Inspection System. This could compromise the accuracy of the data management uses for decision making. In addition, risks can change over time, which is why it is important to have the right data: to identify changing trends and determine the appropriate risk mitigation strategy. This process also serves as an input to a performance metric on whether the AER is achieving optimal outcomes for the effort expended.

Internal reporting and follow-up are informal and not clearly documented—In various operational functions, the AER extracts data and reviews it for resource allocation and decision making. However, the process is informal. For example, EOP directors extract and review data monthly to monitor the targeted four per cent reduction in pipeline incident rate. The response and decisions management takes as a result of this review and analysis are not formally documented.

At the time of our audit, the required level of internal reporting was not defined. We found that senior management did not consistently receive an appropriate level of reporting. The AER would benefit from a formal process that clearly identifies the reports needed by various levels of management. The AER should also document key management decisions that arise from analysis of the reports. Subsequent to our field work being completed, the EOP released an internal report that provided an update on activities and achievements of EOP staff. We did not have the opportunity to verify the sufficiency of this report to determine if it is meeting the AER's internal pipeline performance reporting requirements.

The type and frequency of external reporting of performance information has not been determined—The AER has historically reported publicly on pipeline performance in Alberta, most recently in Report 2013-B: Pipeline Performance in Alberta 1990-2012, and previously through the ST 57—Field Surveillance and Operations Branch Provincial Summary. These reports included detailed information on pipeline incidents and a considerable amount of other pipeline statistics.

At present, the AER has not determined:

- the future intent, process and timing of external reporting
- the target audience for this type of reporting
- roles and responsibilities of individuals involved with external reporting
- its external reporting requirements for pipeline information
- who is accountable for preparing, reviewing and publishing these reports

[17] http://www.aer.ca/documents/news-releases/AERNR2014-21.pdf

Implications and risks if recommendation not implemented

Management does not have all of the relevant tools it needs to make good decisions and evaluate the results of its pipeline oversight function. In the absence of meaningful performance measures and targets, Albertans cannot readily know if the regulator is achieving its pipeline goals effectively.

Response, investigation and reporting of pipeline critical incidents

Background

Critical pipeline incidents can have considerable impact on the public, environment and industry. The AER's role is to oversee and, where appropriate, to help operators with remediation. Operators are responsible for being fully prepared and capable of responding to all levels of emergencies.

The AER classifies an incident as critical when it is in the level 1, 2 or 3 emergency category. Emergency levels escalate as the severity of the situation increases and de-escalate as mitigation strategies take effect. Response actions are determined based upon the assessed emergency level.

There are a number of methods by which an incident is reported to the AER. The most common—and the AER's preferred method—is through the Government of Alberta's Coordination and Information Centre. The centre enables the consistent and appropriate handling of incidents in Alberta. Centre staff receive, track, assess and prioritize incoming calls, and communicate the information to AER staff. Upon receiving information about an incident, an AER employee assesses the incident together with the operator, to determine the emergency level. This is key to ensuring sufficient resources are available to respond to the incident.

Incident response and investigation—The AER has a formal First Incident Response Support Team (FIRST) and an investigation team. Both teams have dedicated resources across the province. The FIRST team includes representatives from various field centres to help coordinate the response during an incident. This team fills four key roles: incident response coordinator, consequence management officer, incident investigator and provincial response team. When the emergency situation is contained, the FIRST team transfers its responsibility to the closest field centre. That field centre oversees the operator's continued remedial action. Responsibility for the oversight of long-term remediation of the environment resides with the Department of Environment and Sustainable Resource Development.

The AER conducts investigations based on the criticality and severity of the incident. Following an investigation, a report undergoes an approval process before being made public. In the course of our audit, we reviewed five pipeline critical incidents.[18]

RECOMMENDATION 7: REVIEW PIPELINE INCIDENT FACTORS

We recommend that the Alberta Energy Regulator:

- expand its analysis of pipeline incident contributing factors beyond the primary causes
- promptly share lessons learned from its investigations with industry and operators

[18] 1) Pace Oil and Gas Ltd. Wellhead Piping Failure, May 19, 2012.
2) Pembina Pipeline Corporation Crude Oil Pipeline Failure, June 15, 2008.
3) Pengrowth Energy Corporation Pipeline Failure, June 26, 2011.
4) Plains Midstream Canada ULC NPS 20 Rainbow Pipeline Failure, April 28, 2011.
5) Plains Midstream Canada ULC NPS 12 Rangeland South, Pipeline Failure and Release into the Red Deer River, June 7, 2012.

Criteria: the standards for our audit

The AER should promptly and thoroughly respond to, investigate and report pipeline critical incidents.

Our audit findings

KEY FINDINGS

- The AER quickly and effectively handled the first response to all five pipeline critical incidents we reviewed.
- Greater benefit could have been extracted from the extensive investigative efforts by examining, in further detail, the contributing factors for critical incidents.
- Lessons learned from an investigation are not consistently shared with operators and the industry.
- The AER conducted an effective follow-up safety and loss management system audit with a pipeline operator.
- The final investigation report review process was time consuming.
- Action items in post-incident assessments were not followed up.

Emergency response and remediation process was effective and timely—The various processes for the response, remediation and containment of emergency situations were well-designed and operating as intended. We reviewed five closed investigation files of pipeline critical incidents going back over the past six years.

Invariably, the first response of the regulator (then ERCB, now AER) to all five incidents was timely and effective. The regulator made sure that sufficient resources were available to respond to these five incidents. Although the responsibility to notify stakeholders rests with the operators, the regulator helped the operators notify these stakeholders, as evidenced in all the files we reviewed.

The AER has also recently implemented a process to post—on its website within 24 hours of the incident—details of incidents that meet certain criteria. Such a process widens awareness of an incident, as well as providing transparent and timely information to the general public and the industry.

Contributing factors deeper than initial root cause were not fully explored—For some of the incidents we reviewed, the regulator identified root causes. However, the regulator did not expand its efforts to further analyze the contributing factors. As a result, it missed an opportunity to improve overall pipeline safety.

For some incidents we reviewed, the regulator relied significantly on root cause analysis reports prepared by the operator or its third party consultants. We found that most of these reports focused on metallurgical or structural reasons for failure and did not probe into contributing factors. Therefore, the reports often left the regulator's investigators with a narrow view of the root cause.

In a few investigations, the regulator could have probed the contributing factors in more detail. For example, it was uncommon to find documentation indicating that the AER had examined and discussed the management system failure aspect of the reviewed incidents with the operator. In the following section, we outline a few examples we identified:

Manual valve control—For one pipeline critical incident, the investigation report referred to the placement of valves and concluded the operator was not in compliance with the CSA Z662 standard. The operator did not have isolation valves close to both sides of a river crossing. However, the report did not state—but we learned from interviews with the investigators—that it appeared the upstream valve could not be operated remotely. The manual shut down of these valves resulted in an 80 minute delay, which contributed to a larger spilled volume. The investigative report rightly concluded that the absence of isolation valves near the river was a contributing factor. However, the report did not discuss the effectiveness of the control room response or whether the 80 minute delay was appropriate.

In practice, some operators have rules in place to isolate a system if the control room readings cannot be interpreted and reconciled within a pre-defined period of time. For operators that have control room operations, it would be useful for them to become aware—through facilitated, shared learning—of factors that contribute to failures in the isolation of the system.

Deficiency in control system—In another pipeline critical incident, the operator failed to understand deficiencies in its SCADA[19] system. The primary causes of failure were inadequate inspection of construction practices; an inability to identify and remediate construction faults; and over-pressuring of equipment after a multiple pump restart that followed an electrical substation power failure. Had there been adequate SCADA protocols in place in the event of power loss, the over-pressuring of the pipes as result of power start up may not have occurred. If this underlying contributing factor had been dealt with at the design stage and properly validated during commissioning, the environmental impact of the incident would likely have been significantly reduced or eliminated.

The investigation report drew attention to the need for operational procedures that anticipate potential problems and the implementation of processes to properly respond to them. However, we found no recommendation in the report, or in the AER's Field Inspection System, of a need to raise awareness of the possibility of faulty pump control logic, or the need to consider providing backup power to the broader pipeline community.

Overall, the critical incidents we examined all had an underlying management system failure on the part of the operator. This emphasizes the need on the part of operators to assess the effectiveness of their integrity management programs and safety and loss management systems. It also speaks to the AER's need for a process to verify that this is the case.

Lessons learned from investigations are not consistently shared—The AER does not have a formal process for sharing lessons learned from incidents with the operators and the industry. Given that contributing factors are important findings from an investigation, sharing this information is an important way to prevent similar incidents from happening in the future. The AER placed the onus for sharing findings with the broader industry on the operator. However, the AER has no process to verify if a finding has been shared with the industry or not. This limits the sharing of lessons learned and opportunities for continuous improvement with the operators and industry at large. The AER would benefit from a mechanism for sharing with the operators and the broader community the lessons it learns from all types of pipeline incidents. We believe the AER can balance the public interest through timely sharing of lessons learned with the industry, while still protecting the investigation process.

Good use was made of a safety and loss management system audit to follow up on a pipeline incident—To respond to an underlying management system failure in one instance, the AER conducted

[19] SCADA (Supervisory Control and Data Acquisition), a type of industrial control system, is a system operating over communication channels to provide control of remote equipment. SCADA or programmable logic controllers systems are in widespread use in the pipeline industry.

a focused safety and loss management system audit (on Plains Midstream Canada ULC). The results of the audit were posted on the AER's external website in late 2014. For this audit, the AER supplemented its internal expertise by engaging external consultants. This useful practice can add value to the investigation process, especially in situations where the AER may require resources to expand on the breadth and extent of the root cause and factors contributing to a significant incident.

Reporting was comprehensive, but review activities were drawn out—AER investigations vary in detail and complexity. For the incidents we reviewed, the timeline from the initial investigators' report to the final report required an average of eight months. Overall, the incident report review process was time consuming and in need of streamlining to ensure a prompt release of the results of the investigation.

Action items in post-incident assessments were not followed up—Some incident files included a post-incident assessment. This assessment identifies lessons learned from the incident process to enhance the AER's internal processes. We found no evidence that AER staff or management had followed up on action items in these assessments. The AER has not defined when it requires a post-incident assessment nor does it have a process to track its own follow-though on the action items.

Implications and risks if recommendation not implemented

If pipeline incidents are not fully investigated for contributing factors, the regulator, industry and the public cannot be sufficiently satisfied that everything reasonably possible is being done to avoid similar incidents in the future.

Collecting information from pipeline operators

Background

The *Pipeline Act*, the pipeline regulation and various AER directives outline the type of information and records that operators must possess. Some information must be submitted proactively, for the AER's review and approval. Other information, relating to material properties and test pressures, for example, must be kept and maintained by the pipeline operators for a period of time, and made available upon request by the AER.

The AER, through its monitoring and enforcement activities, verifies the accuracy of the information it requires operators to maintain. The AER mainly uses its Field Inspection System (FIS) to capture information about pipeline compliance activities.

RECOMMENDATION 8: ASSESS CURRENT PIPELINE INFORMATION

We recommend that the Alberta Energy Regulator complete an assessment of its current pipeline information needs to support effective decision making and determine the type and extent of data it should collect from pipeline operators, through a proactive, risk-based submission process.

Criteria: the standards for our audit

The AER should collect appropriate, sufficient and timely information from pipeline operators, to enable it to carry out its regulatory functions.

Our audit findings

KEY FINDINGS

- The AER is collecting and reviewing information as prescribed in the pipeline regulation and directives.
- An assessment of current and future pipeline information needs has not been completed.
- The AER has not mitigated risks of operator transfer of ownership.
- The AER is taking a proactive approach to incident reporting requirements.
- An assessment of key information systems' ability to meet AER's regulatory needs is not complete.

Pipeline data collection and review of regulatory prescribed information is being completed—The AER is collecting and reviewing pipeline information, as prescribed in its pipeline regulatory functions, and noting deficiencies. We confirmed that the AER has a process to verify the information it requires operators to maintain. For example, emergency response plans have to be submitted proactively by operators that meet certain criteria. Our examination of the AER's review and approval process for these plans indicates that it is operating effectively.

Pipeline data needs assessment has not been completed—The AER has not assessed whether the data it collects from pipeline operators is adequate for managing its risk as a regulator. A full assessment of its pipeline data needs would help the AER find out if the information it receives is helping the AER to make informed decisions and achieve its goals and objectives. This process would allow the AER to identify whether it needs to define further data requirements from the industry and have the information submitted proactively.

With constant change—including but not limited to technology, materials and the environment—data the AER collected in the past may not be relevant for decisions it makes today. For example, since steel pipelines are more prone to internal and external corrosion, the industry has recently increased its use of composite materials. However, these new materials have failure types other than corrosion. AER staff have observed a trend of increasing failures caused by improper construction of composite pipelines. Thus, data on construction schedules of composite pipelines might be useful information.

A detailed schedule would allow the AER to plan its construction site visits to target risk areas. This emphasizes the need for the AER to recognize industry trends, assess the relevance of current information to the identified trends, and determine if changes in data requirements should follow.

The AER has not mitigated risks of operator transfer of ownership—Risks associated with the transfer of ownership occur when complete records are not transferred at the time of the sale, and when there is improper ongoing maintenance in the period immediately before the sale. There have been pipeline failures as a result of the previous owner not maintaining internal corrosion mitigation operations. The AER is aware of this issue and is looking for a way to have the seller deal with them before allowing the transfer of ownership. The Liabilities and Closure group indicated the AER has the capabilities to achieve this; however, the process is manual and labour intensive. To date, this level of oversight has not been applied to any operators who are selling assets.

The AER is taking a proactive approach to incident reporting requirements—The AER, as part of the CSA Z662 committee, has been proactive in recognizing current incident details to be added to the CSA Z662 standard. Part of CSA Standard Z662-11 Oil and gas pipeline systems, Annex H—spells out requirements for incident reporting. Work is underway on the 2015 version of the CSA Z662 standard. If approved, this revision is intended to provide much more detailed information and a better descriptor of incidents. The new incident reporting requirements will provide better and more consistent reporting, to allow for the appropriate trending analysis to support regulators' decisions.

Assessment of Field Inspection System's ability to meet AER's regulatory needs is not complete—The AER's FIS system may not be able to do everything the AER wants or needs it to do. The AER relies on the FIS as its source of record for detailed information about well sites, pipelines and other oil and gas infrastructure. The AER also relies on it for new and more detailed reporting to meet changes in its organizational goals and objectives. Once the AER has a clear IT strategy that aligns with and supports its overall goals, objectives and future needs, it can define and then implement the technology and processes needed to meet its regulatory goals and objectives. The AER confirmed that it is considering how to deal with the risk that the FIS system may not, in its present form, support its present and future needs.

Implications and risks if recommendation not implemented

Without a proper assessment of its data needs, the AER is at risk of not having sufficient and relevant information to make informed decisions. This in turn puts the AER at a greater than necessary risk of not fulfilling its regulatory duties effectively.

Monitoring of pipeline operations

Background

The AER's regulatory duties are outlined in the *Pipeline Act*, rules and regulation. Procedures and manuals, based on the act and rules, also help AER staff carry out their monitoring activities. Key monitoring activities are separated into reactive and proactive categories. Inspection is the main tool for both proactive and reactive monitoring. The AER conducts incident response, detailed operation, construction, baseline and random inspections. The Field Information System is the main operational system it uses to track the results of monitoring activities.

Reactive activities—These include responding to public complaints and incidents. These activities consume substantial AER staffing resources. The AER is mandated to respond to all pipeline incidents (which may be failures) and public complaints.

Proactive monitoring activities—The key proactive activities are detailed operation inspections and construction inspections. Planning for proactive monitoring is done annually by the Provincial Pipeline Technical Specialist. The AER allocates resources first to its reactive activities, assigning the remaining resources to proactive activities.

Integrity management programs and safety and loss management systems—The AER adopted CSA Standard Z662-11 Oil and gas pipeline systems as mandatory in fulfilling its pipeline regulatory functions. The CSA Z662 standard provides the foundation for the AER's inspection program—Manual 005. In addition, all pipeline inspections are conducted with reference to this standard. Clause 3.1 and 3.2 in the CSA Z662 standard require operators to develop and implement effective safety loss and integrity management systems. All such programs and systems have, at their core, the central theme of continuous improvement, as well as to serve the main purpose of keeping the products in the line. As long as the transported fluid remains within the pipeline, its integrity is assured, the public is kept safe and the environment remains protected. Annex N—Guidelines for pipeline system integrity management programs in CSA Z662 is also mandatory for operators.

RECOMMENDATION 9: IMPLEMENT RISK-BASED COMPLIANCE PROCESS

We recommend that the Alberta Energy Regulator implement a cost effective risk-based compliance process to evaluate the adequacy and effectiveness of pipeline operators' integrity management programs, and safety and loss management systems.

Criteria: the standards for our audit

The AER should have systems to manage, fulfill and enhance its pipeline monitoring activities.

Our audit findings

KEY FINDINGS

- The AER carries out its core pipeline monitoring activities in accordance with provincial and federal regulatory requirements.
- There is no formal process to evaluate the effectiveness of operator safety and loss management systems and integrity management programs.
- AER response to pipeline integrity requirements is pending.

The AER carries out its core monitoring activities in accordance with the pipeline regulatory requirements—We tested a representative sample of the various types of inspections files and found the AER conducted them appropriately. We also verified that staff had correctly evaluated the reported incidents and complaints and had responded to these issues appropriately.

As part of the audit, we visited three of the nine field centres in the province. The main purpose of these visits was to understand the monitoring processes and procedures that AER staff follow in carrying out their regulatory duties and to verify their consistent application. From our visits and audit sampling of the proactive and reactive activities, we confirmed that AER staff have been consistently following the pipeline processes and procedures. We also attended a detailed operation inspection and a new construction inspection and found the staff had appropriately followed the processes and procedures when conducting these inspections.

The AER lacks a formal process to assess integrity management programs and safety and loss management systems—The AER requires operators to adopt the CSA Z662-03—Annex N standard to develop and implement effective integrity management programs and safety and loss management systems. However, the AER does not have a risk based process to assess the effectiveness of these programs and systems, whether through operator self-assessment, audits or by other means. In addition, qualified and adequate resources need to be available to assess the adequacy of licensees' integrity management and safety and loss management programs and systems. The regulator's detailed operation inspections test some elements of these programs and systems; however, they lack sufficient depth to assess the adequacy and effectiveness of safety and loss management systems.

A "one size fits all" approach to verify the effectiveness of these systems isn't tenable. Alberta's large pipeline operators have internal resources and the means for developing and self-assessing programs. Smaller operators lack these resources. In some circumstances, it may not be practical for smaller operators to develop and maintain integrity management programs to the same extent as larger operators. However, the underlying integrity concepts set out in the CSA Z662 standard are scalable. It behooves smaller operators to have in place procedures that are both fit for purpose over the life of a pipeline and capable of achieving the desired end result from a regulatory perspective.

Furthermore, very few operators actually have pipeline transportation as their principal business activity. For most it is an ancillary part of their energy development activity, even though it is essential to the sustainability of the overall process as these smaller gathering systems connect the well head to

batteries and processing. Treating pipeline operation as non-core to their business can have a negative effect on their approach to staff resourcing and management commitment.

AER response to pipeline integrity requirements is pending—In 2007 the Energy Utilities Board (a predecessor of the AER) developed a self-assessment tool—Pipeline Integrity Management Program Assessment Forms and Guidelines. As a pilot project, three operators did self-assessments of their integrity management programs using this form. The experience from this project was used to improve the self-assessment tool. Following this, a voluntary audit was completed with one operator. Deficiencies were identified as a result of the audit and the EUB worked with the operator to correct them.

The opportunity to expand this program to other operators, however, was put on hold. Staff told us this was because of constraints on resources. The project has not been revisited since that time. Scenarios such as this, where the value of the activity is acknowledged but its implementation is resource constrained, demonstrate the need for applying risk to drive resource allocation.

Implications and risks if recommendation not implemented

Without a risk-based compliance process to assess the effectiveness of operator integrity management programs, and safety and loss management systems, the AER is at risk of missing an opportunity to enhance pipeline safety and achieving its objectives and targets for incident reduction.

Enforcement of pipeline operations

Background

Before July 1, 2014, the EOP branch followed Directive 19—Compliance Assurance to enforce non-compliance identified as a result of inspections and other monitoring activities. Subsequent to July 1, 2014, the EOP branch began to follow a new enforcement framework to deal with non-compliance it identifies through monitoring activities. One significant change is that non-compliance results from inspections are treated as abatements for which the AER requires operators to remediate deficiencies within a set timeframe. All non-compliance identified from monitoring activities are now triaged for investigation. Furthermore, the new compliance framework introduces a punitive investigation process.

Criteria: the standards for our audit

The AER should have systems to discharge and enhance its pipeline enforcement activities.

Our audit findings

KEY FINDINGS

- Enforcement of non-compliance process was appropriately followed.
- The AER provides important presentations to industry to facilitate compliance.

Enforcement process was appropriately followed—Based upon our examination of a representative sample covering a wide range of enforcement categories, we found the AER had complied with Directive 19 in its non-compliance enforcement process. Specifically, in situations where the non-compliance qualified for an escalation, the AER appropriately escalated the issue and ensured the enforcement requirements were met within a set timeframe. We also tested a sample of appeals and found the overall appeal processes were reasonable, including workgroup discussion at the field centre level and at the Calgary head office level.

The AER is finalizing a new compliance framework. It has completed an analysis of the ERCB and ESRD compliance frameworks and applied lessons learned to its new framework. Given that the

implementation date of the new process was July 1, 2014, not enough time had passed and not enough completed files were available to demonstrate the effectiveness of the process. As a result, we did not assess controls over the new process. During our follow-up audit, we will include the new process as part of our scope.

The AER provides important presentations to industry to facilitate compliance—Education is a key component of the compliance framework. The AER offers presentations to industry stakeholders, to clarify the AER's regulatory processes, procedures and agreements, and educate the industry on common issues to prevent them from reoccurring. The presentation topics include emergency response overviews, ground disturbance requirements, release reporting requirements, pipeline operator awareness sessions and pipeline performance. The AER also invited industry participants to present in the sessions. This encouraged the sharing of best practices among stakeholders.

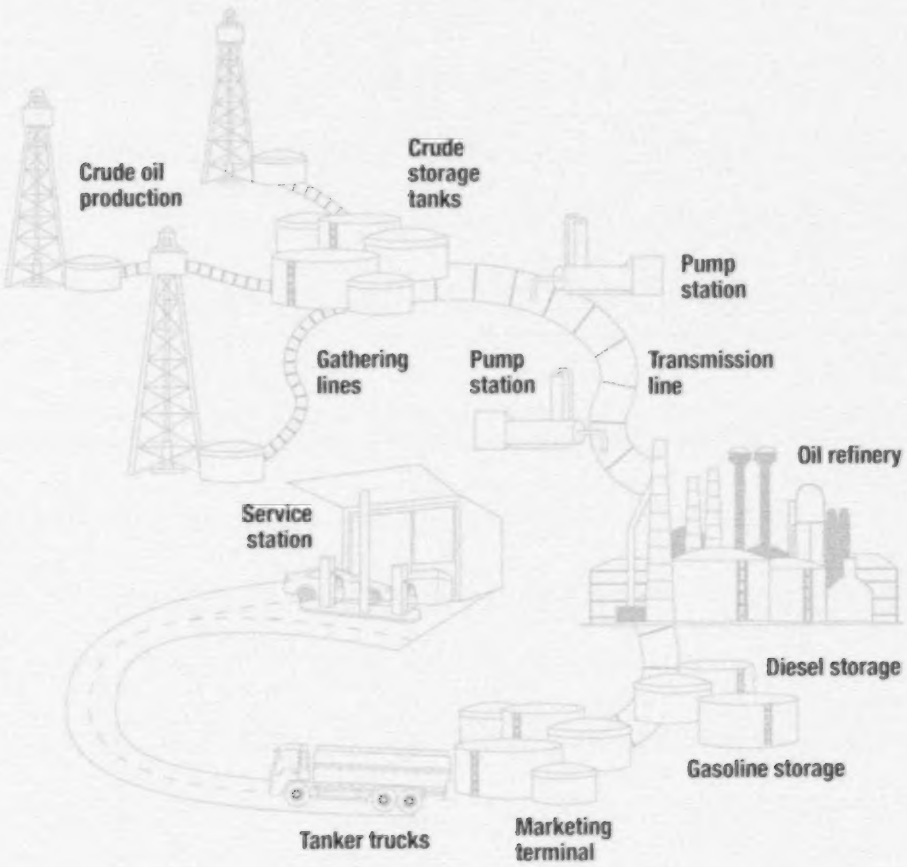
Appendix A

PIPELINE INFORMATION

Liquid pipelines

These pipelines transport crude oil and natural gas from producing fields to refineries. Powerful pumps spaced along the transmission lines (largest pipelines) push the refined petroleum products to terminals and distribution centres. Refined petroleum products include gasoline, diesel, jet fuel and heating oil. The figure below illustrates the crude oil delivery network.[20]

The crude oil delivery network

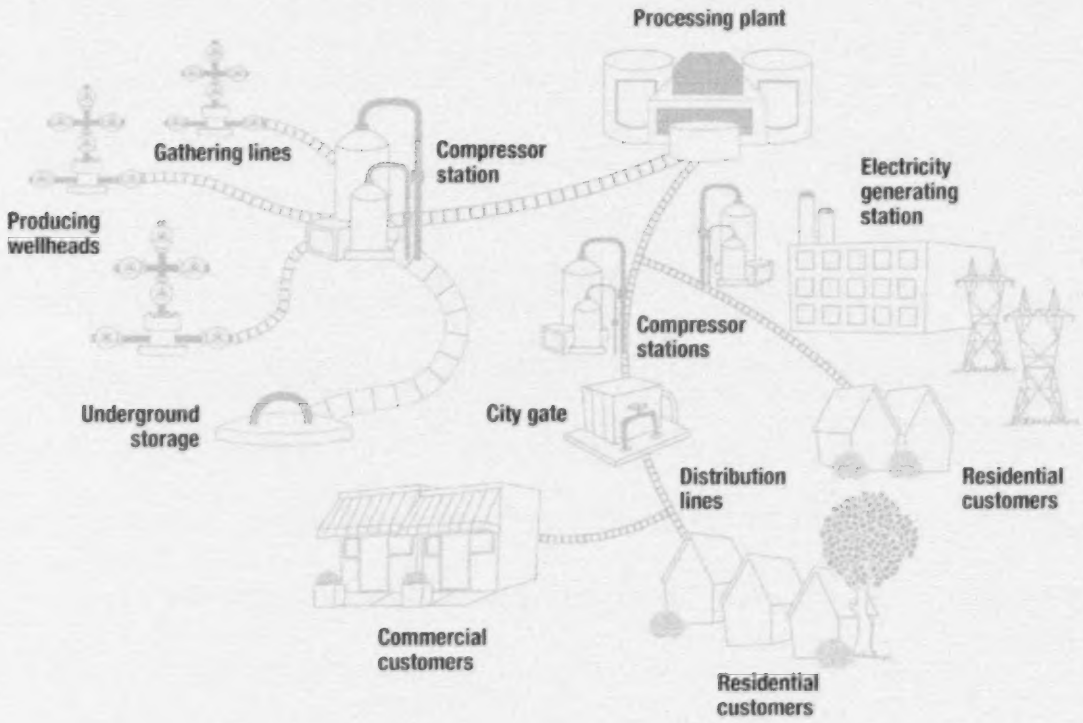


[20] http://www.cepa.com/about-pipelines/types-of-pipelines/liquids-pipelines

Natural gas pipelines

These pipelines transport natural gas from gas wells to processing plants for the removal of impurities, water and other gases. Natural gas liquids (NGLs) are also extracted from gas plants and transferred to oil refineries for processing. The refined natural gas is then transferred through the pipelines using compressors that have the "pushing" effect, from areas of high pressure to low pressure, then to distribution systems where the products are delivered directly to residential and commercial customers. The figure below illustrates the natural gas delivery network.[21]

The natural gas delivery network



[21] http://www.cepa.com/about-pipelines/types-of-pipelines/natural-gas-pipelines

Appendix B

PIPELINE STATISTICS

Liquid pipelines

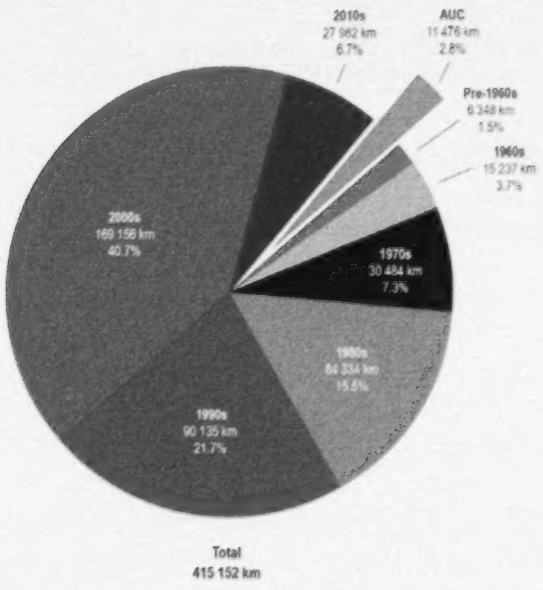
Length of Alberta pipelines

In 2012, the length of different pipeline types was as follows in Alberta.[22]

PIPELINE TYPE	LENGTH (KM)
Alberta Utilities Commission (AUC) natural gas utility pipelines	11 476
Crude oil pipeline	20 272
Multiphase pipeline	61 576
Natural gas pipeline	238 582
Other pipeline	36 161
Sour gas pipeline	22 612
Water pipeline	24 473
Total	**415 152**

Alberta pipeline by decade of construction

Here is how pipelines have developed in Alberta, from the pre-1960s to the present decade.[23] The following chart identifies provincial pipeline that is still in use. (The AUC pipeline added in this decade reflects the chart's original source, not our audit focus.)



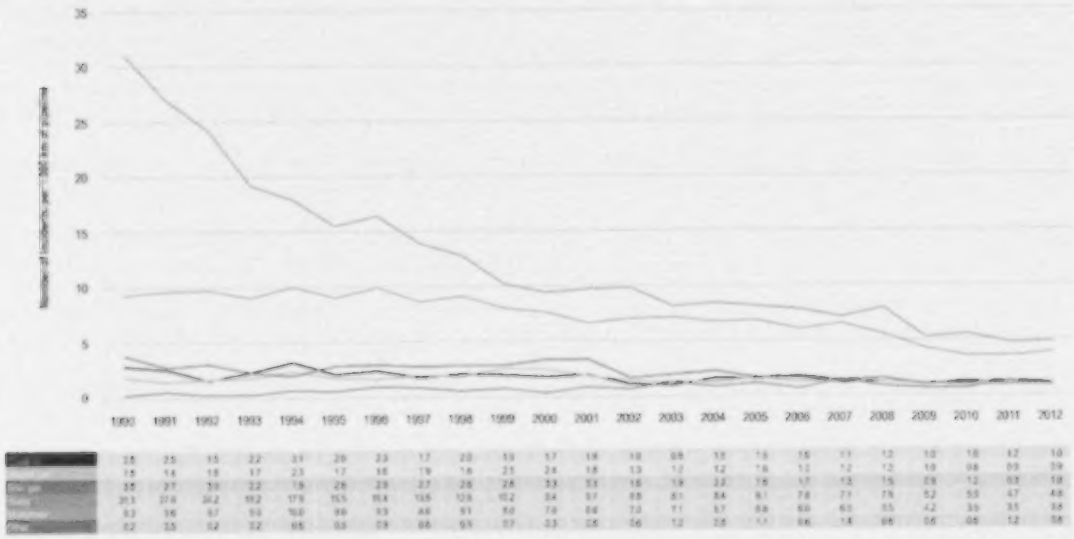
[22] Energy Resources Conservation Board, ST57-2013, Field Surveillance and Operations Branch—Field Operations Provincial Summary 2012, page 9.

[23] Report 2013-B: Pipeline Performance Information in Alberta, 1990-2012, August 2013, page 11.

Average frequency of pipeline incidents by year and pipeline substance

All pipeline incidents from January 1, 1980 to December 31, 2012 (includes all hits, leaks and ruptures) are included in the following graph.[24]

Figure 27. Average frequency of pipeline incidents by year and pipeline substance
All pipeline incidents from January 1, 1980 to December 31, 2012 (includes all hits, leaks, and ruptures)



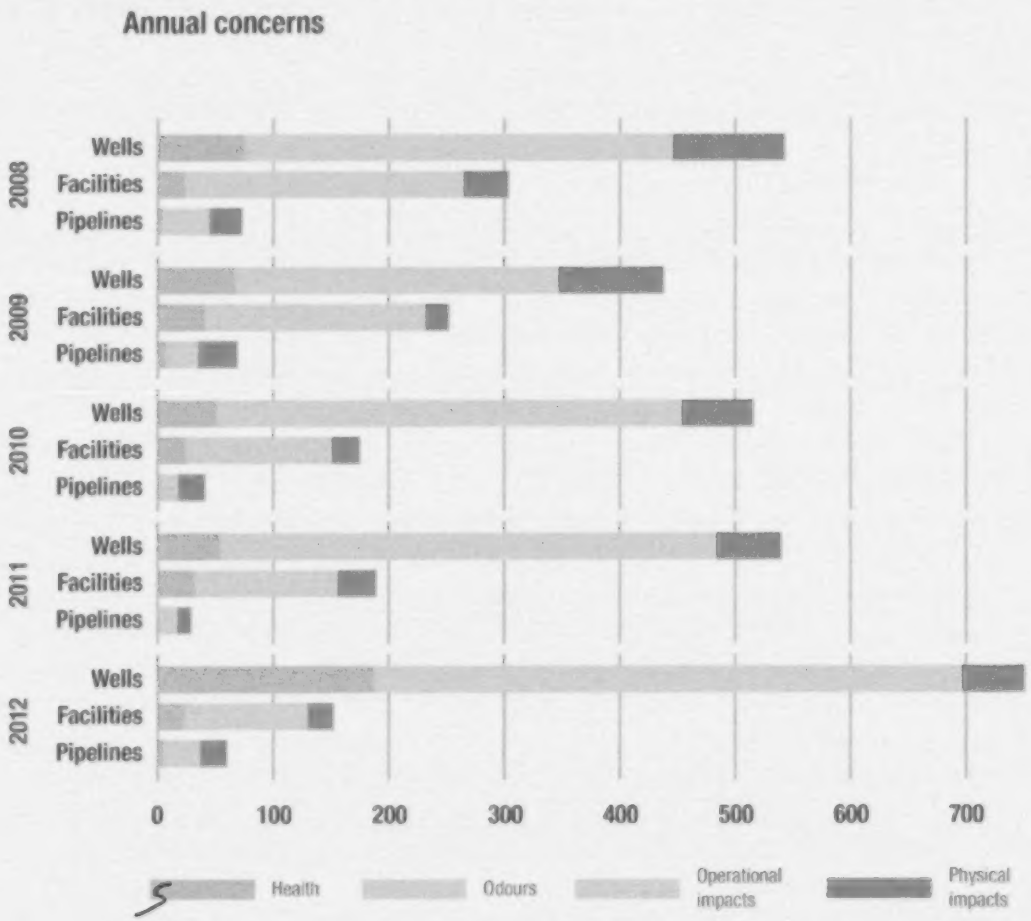
[24] Report 2013-B: Pipeline Performance Information in Alberta, 1990-2012, page 91.

Public complaints—annual concerns from 2008 to 2012

Public concerns include the following:

- **health**—possible impacts on human or animal health by upstream oil and gas activities
- **odours**—all odour types (e.g., H_2S, SO_2)
- **operational**—effects of facility operations (e.g., explosion, fire, flare, smoke, spill, uncontrolled flow, nuisance, noise, dust)
- **physical**—possible impacts on public safety, land, water wells, or other (e.g., lease management, public hazard, property damage, water wells)

The following chart illustrates the total number and categories of concerns from 2008 to 2012.[25]



[25] Energy Resources Conservation Board, ST57-2013, Field Surveillance and Operations Branch—Field Operations Provincial Summary 2012, page 3.

Appendix C

PIPELINE INCIDENTS INFORMATION

Alberta oil spills

The following outlines notable Alberta oil pipeline spills from 2006 to 2012. The information is based on incident data extracted from the AER Field Inspection System.

	INCIDENTS	INCIDENT DATE	DETAILS	RELEASE VOLUME
1	2012 Enbridge Pipelines (Athabasca) Inc. oil pipeline spill	June 18, 2012	Enbridge reported the Athabasca pipeline spill of heavy crude oil at a pumping station at Elk Point, Alberta.	~**230** m^3 of crude oil
2	2012 Plains Midstream Canada ULC pipeline crude oil spill	June 7, 2012	Sundre Petroleum Operators Group, a not-for-profit society, informed Plains Midstream Canada of an oil pipeline spill into Jackson Creek, a tributary of the Red Deer River located north of Sundre, Alberta.	~**500** m^3 of crude oil
3	2012 Pace Oil and Gas Ltd pipeline oil spill	May 19, 2012	Plains Midstream Canada notified Pace Oil and Gas that a spill was occurring at one of its water disposal wells in the Rainbow Lake Oil Field. The spill was about 20 kilometres southeast of the Rainbow Lake townsite.	~**800** m^3 of crude oil
4	2011 Pembina Pipeline Corporation crude oil spill	July 19, 2011	Pembina Pipeline Corporation reported a crude oil spill on its pipeline north of Swan Hills, Alberta.	~**200** m^3 of crude oil
5	2011 Pengrowth Energy Corporation explosion and oil spill	June 26, 2011	Pengrowth Energy reported an explosion and oil pipeline spill that leaked combination of crude oil and produce water into Judy Creek in the Swan Hills area. There were also some gas being released.	~**5** m^3 of crude oil **10** m^3 of gas production **95** m^3 of salt/produced water
6	2011 Plains Midstream Canada ULC Rainbow pipeline oil spill	April 29, 2011	Plains Midstream Canada detected a massive pipeline rupture of crude oil on the Rainbow pipeline near Little Buffalo, Alberta.	~**4,500** m^3 of crude oil

	INCIDENTS	INCIDENT DATE	DETAILS	RELEASE VOLUME
7	2008 Suncor Energy Inc. diesel fuel pipeline spill	July 15, 2008	Suncor reported a pipeline leak and spill of diesel fuel in Fort McMurray area.	~**200** m^3 of diesel oil
8	2008 Pembina Pipeline Corporation oil pipeline spill	June 15, 2008	Pembina Oil Pipeline reported oil pipeline rupture into the Red Deer River.	~**28.1** m^3 of crude oil
9	2008 Penn West Petroleum Ltd oil pipeline spill	April 30, 2008	Penn West pipeline released crude oil into the Otauwau River and Slave River, near the towns of Smith and Athabasca.	~**20** m^3 of crude oil
10	2006 Rainbow Pipeline Corporation oil pipeline spill	October 10, 2006	Rainbow Pipeline reported a major crude oil pipeline spill that leaked into a series of ponds and beaver lodges.	~**1,200** m^3 of crude oil

Environment and Sustainable Resource Development—Flood Mitigation Systems

SUMMARY

Flooding is one of the most costly and destructive natural disasters in Canada. Every year, governments typically spend millions of dollars cleaning up after floods and providing disaster assistance to municipalities, businesses and people who suffered losses. Flooding is also a significant risk to public safety.

Effective flood mitigation can reduce the damage caused by floods. Flood mitigation is the process of planning and acting to reduce and avoid the effects of flooding and minimize the damages it causes. In Alberta, the Department of Environment and Sustainable Resource Development is responsible for flood mitigation.

The Government of Alberta recently developed two documents on flood mitigation:

- *Resilience and Mitigation Framework for Alberta Floods* (December 2013)—to plan, coordinate, assess and implement flood mitigation in Alberta's watersheds
- *Respecting Our Rivers: Alberta's Approach to Flood Mitigation* (April 2014)—to outline the government's mitigation actions to provide resilience against future floods and to bring together projects at the regional and local levels

The Government of Alberta has approved $1.4 billion in funding for structural and non-structural projects to reduce the risk of floods in Alberta.

Context of our audit

When we started the audit, the Government of Alberta was already providing recovery support to communities affected by June 2013 flooding in southern Alberta. Since then, the government has developed a plan for dealing with future floods. Its flood mitigation initiatives are now at various stages of completion. Our audit focused on the department's flood mitigation planning, which should include systems to identify where flood risk exists, who is at risk and what is at risk. We did our audit at this time so that we could provide the department with timely recommendations to improve its flood mitigation systems.

What we examined

We assessed whether the department has adequate systems to develop and implement a flood mitigation plan.[1] We examined the department's plan as well as its flood risk identification and assessment systems, which are foundational pieces to any flood mitigation plan.

Overall conclusion

The department has taken significant actions since the June 2013 floods to develop and implement a flood mitigation plan. However, the department needs to further improve its systems to identify where

[1] In this report, "flood mitigation plan" refers to both documents: Resilience and Mitigation Framework for Alberta Floods and Respecting Our Rivers: Alberta's Approach to Flood Mitigation.

the risk is, who is at risk and what is at risk. These system improvements will allow the department to better assess, plan for and mitigate flood risks.

What we found

The Department of Environment and Sustainable Resource Development has not:

- created complete and up-to-date maps to identify flood hazard areas—Some communities at risk of flooding have never been mapped. Others have maps over 20 years old. Not having complete and up-to-date maps limits the department's ability to manage flood risks.
- developed processes to identify and quantify flood risks—Risk assessment is a function of knowing where the flood hazard is and estimating its consequences. The department has not captured information about the consequences of past floods, such as lives lost, injuries, property damage and business interruption. Good risk assessment processes inform decision makers and stakeholders, and can be used to select the best flood mitigation options from a number of alternatives.
- developed adequate systems to assess what will be the cumulative effect of flood mitigation programs and initiatives on communities—Because it offers various flood mitigation programs, the department should have processes to assess what will be the cumulative effect of flood mitigation actions before approving new projects.

Alberta has not had a consistent approach to managing development in flood hazard areas. Municipalities have not been required to deal with flood hazards in their land use by-law. This has resulted in inconsistent land use by-laws across the province because some municipalities restricted development in the floodway and others did not. In 2013 the *Municipal Government Act* was changed to allow the Government of Alberta to create regulations that would control, regulate or prohibit development of land in a floodway. The Department of Municipal Affairs is currently developing the *Floodway Development Regulation*. The regulation is intended to bring a more consistent approach to land use in flood hazard areas across the province. Floodways are identified by ESRD on flood hazard maps prepared as part of its flood hazard identification program.

Why this is important to Albertans

Effective flood mitigation improves public safety and reduces the effects and costs of flooding in Alberta.

What needs to be done

Experience from disasters around the world shows a window of 18 to 24 months after a major event when there is strong public and political support to spend money on measures to improve public safety. Since the 2013 flood, the department has developed a flood mitigation plan and allocated significant resources to manage future flood risks. This sense of urgency needs to continue to ensure Albertans receive the full benefit of that investment.

The Department of Environment and Sustainable Resources needs to:

- improve its processes to update its flood hazard maps and mapping guidelines, and map previously unmapped areas at risk
- implement flood risk assessment processes to justify spending money on flood mitigation
- establish processes to cumulatively assess what the effects will be of various flood mitigation efforts at the community level when approving new projects or initiatives

To control future development in Alberta's flood hazard areas, the departments of ESRD and Municipal Affairs have complementary roles. ESRD needs to identify flood hazard areas and Municipal Affairs needs to establish processes for controlling, regulating or prohibiting future land use and development in

the flood hazard areas. Municipal Affairs also needs to put processes in place to enforce the regulatory requirements once they are complete.

AUDIT OBJECTIVES AND SCOPE

We assessed whether the Department of Environment and Sustainable Resource Development has adequate systems to develop and implement a flood mitigation plan. We focused on its planning and risk assessment processes. We did not examine the progress made on individual flood mitigation projects because most of the flood mitigation projects had just been approved while we performed our audit, or they were still being assessed. The department continues to refine the processes to develop and implement the flood mitigation plan that we audited.

We were assisted on this audit by two specialists with significant experience with the subject matter. The first specialist, a consulting engineering firm with expertise in flood mapping, hydrologic and hydraulic computing modelling, reviewed the department's methodology and processes to conduct flood hazard mapping studies and flood risk assessments. The second specialist, a university professor and contributing author to numerous publications on reducing the risk of loss from floods and other natural disasters, reviewed the department's flood mitigation plan.

We did not examine the Government of Alberta's emergency response to the 2013 flood, nor did we examine the Department of Municipal Affairs' disaster recovery program.

We conducted our field work from May 2014 to December 2014. We substantially completed our audit on January 12, 2015. Our audit was conducted in accordance with the *Auditor General Act* and the standards for assurance engagements set by the Chartered Professional Accountants of Canada.

BACKGROUND

Floods in Alberta

A flood is an overflow of water onto land that is usually dry. Flooding can occur due to overflow of water from water bodies such as rivers and lakes. The main causes of flooding in Alberta are heavy rainfall and snowmelt, alone or combined. Heavy rainfall causes most of Alberta's worst floods.

Floods in Alberta happen regularly, but timing, size and location make each flood unique. Alberta has had large floods in 12 of the past 135 years, mostly in southern Alberta:

- 1879 and 1897, Fort Calgary
- June 1915, Calgary
- June 1929, Calgary and southern Alberta
- 1964 and 1975, southern Alberta (Oldman River Basin)
- 1986, central and southern Alberta (Milk, North Saskatchewan and Athabasca river basins)
- 1995, southern Alberta (Oldman River and Red Deer River Basin)
- 2005, central and southern Alberta
- June 2010, southern Alberta, Cypress Hills
- June 2011, central and southern Alberta
- June 2013, Calgary, High River, Canmore and southern Alberta

The June 2013 flood began when a slow, intense low-pressure weather system delivered 80 to 275 mm of rain to the eastern slope of the Rocky Mountains, causing the Bow, Elbow, Highwood and other rivers to overflow their banks. The flooding across southern Alberta affected an area of 55,000 square kilometres. Significant damage occurred to roads, critical infrastructure and public facilities. Alberta declared the first provincial state of emergency in its history, for the Town of High River. More than 30 local states of emergency were also declared.

The June 2013 flood had the following effects on Albertans and their communities:[2]

- Five people lost their lives.
- Rebuilding costs were estimated at over $6 billion.
- 100,000 people were displaced, in 30 communities.
- About 14,500 homes were damaged.
- The government received 10,500 Disaster Recovery Program applications.
- More than 1,500 businesses were disrupted.
- Several schools, health facilities and bridges were damaged.

Roles and responsibilities

In July 2013 the Government of Alberta published a framework[3] describing how the government will support communities in their recovery, from the onset of flooding to the completion of long-term recovery efforts. The key governance structures to lead and support these efforts were the Ministerial Flood Recovery Task Force and an Assistant Deputy Ministers Flood Recovery Task Force.[4] Within the Assistant Deputy Ministers Task Force, the Resilience and Mitigation Team reviewed and prioritized flood mitigation projects. The task forces wound down operations by September 2014.

The Department of ESRD is now responsible for provincial flood mitigation. The department's River Hazard Management Team is responsible for producing flood hazard studies and maps. The Resilience and Mitigation Team joined the department in April 2014. Other departments that support mitigation include Municipal Affairs, Infrastructure, Transportation, Agriculture and Rural Development, and Treasury Board and Finance.

All levels of government have a role in flood mitigation. The federal government pays federal disaster assistance funds to the provinces for floods. Municipalities develop land use by-laws in their communities. Local authorities (municipalities, First Nations, irrigation districts, watershed planning and advisory councils, non-government organizations) play various roles. So do homeowners.

A 100-year flood—not what it seems

Alberta uses the concept of a "100-year flood" as a benchmark (a specific water level or flow rate) to assess and manage flood hazards on its rivers. A 100-year flood has a one per cent chance of occurring in any given year. It is also called a one per cent flood. Common misconceptions are that a 100-year flood occurs only once in 100 years and that there will be 100 years between floods of this size. In reality, a river has a 63 per cent chance of having one or more 100-year floods in any 100-year period.[5] A 100-year flood can happen two years in a row.[6] Most floods are either larger or smaller than the 100-

---

[2] Southern Alberta Floods: One-Year Report, June 2014.

[3] The Provincial Recovery Framework published by the Government of Alberta in July 2013.

[4] The ministerial task force comprised ministers led by the Minister of Municipal Affairs. It set direction and made decisions, specifically policy decisions, on behalf of the government to support and coordinate the flood response and recovery. The Assistant Deputy Minister Task Force supported the ministerial task force and coordinated the intermediate and long-term recovery efforts.

[5] *Operations of River Hazard Management Team*, Kerr Wood Leidal Associates Ltd.

[6] http://water.usgs.gov/edu/100yearflood.html

year flood. Peak flows for the June 2013 flood were greater than the peak flows for a 100-year flood on some rivers and came close to such a flow on others.

Flood mitigation

Flood mitigation is the process of planning and acting to reduce or avoid the effects of flooding and minimize the damage it causes to people and society. Mitigation involves non-structural and structural actions. Non-structural flood mitigation includes plans and policies that help government to:

- better understand and predict floods
- identify, map and designate flood hazard areas[7]
- use zoning by-laws and other tools to prohibit building in areas that will flood (floodways) and restricting development in areas that could flood periodically (flood fringe zones)
- adopt building codes that minimize flood damage to structures
- create or support a homeowner flood insurance program (as in other G8 countries.[8])

Structural flood mitigation includes:

- raised riverbanks, including berms and dikes or specialized walls
- dams and storage areas
- ditches, diversion channels and underground flood tunnels
- erosion control works like rock slopes and riverbank vegetation

The Alberta government published two documents on flood mitigation:

- Resilience and Mitigation Framework for Alberta Floods (December 2013)—to plan, coordinate, assess and implement flood mitigation in Alberta's watersheds
- Respecting Our Rivers: Alberta's Approach to Flood Mitigation (April 2014)—to outline the government's mitigation actions to provide resilience against future floods and to bring together projects at the regional and local levels

The documents outline roles and responsibilities, guidance and evaluation criteria for selecting mitigation projects and actions. The Alberta government has approved $1.4 billion for various flood mitigation programs and initiatives. (See Appendix A for a breakdown of the funding.[9])

---

[7] Appendix B defines the flood hazard area, floodway and flood fringe.

[8] http://www.theglobeandmail.com/news/national/province-was-warned-of-alberta-disaster-fund-problems/article19233823/#dashboard/follows/

[9] The Department of ESRD provided this information to us in November 2014.

FINDINGS AND RECOMMENDATIONS

Identifying flood hazards through mapping

Background

The department has produced flood hazard maps since the 1970s. From 1989 to 1999, it produced maps under the Canada–Alberta Flood Damage Reduction Program. Since 1999, the department has produced flood hazards maps under the Flood Hazard Identification Program. Its objectives[10] were to:

- identify flood prone areas and minimize the risks and costs associated with flooding
- provide advice for the use and non-use of flood prone lands
- increase public awareness of flood hazards in communities

The department uses the 100-year flood as the benchmark for floods and water elevation increases. To create a flood hazard study, the department assesses the river system's stream flow data and historical flood records. The outcome of the study is a report and a flood hazard map showing the flood hazard area. Flood hazard maps are divided into two zones: the floodway, where further development is discouraged, and the flood fringe, where development is possible with minimum flood mitigation measures. (See Appendix B for definitions of flood hazard area, floodway and flood fringe.)

RECOMMENDATION 10: UPDATE FLOOD HAZARD MAPS AND MAPPING GUIDELINES

We recommend that the Department of Environment and Sustainable Resource Development improve its processes to identify flood hazards by:

- mapping flood areas that are not currently mapped but are at risk of flooding communities
- updating and maintaining its flood hazard maps
- updating its flood hazard mapping guidelines

Criteria: the standards for our audit

The department should have adequate processes to identify flood risks.

Our audit findings

KEY FINDINGS

- The department does not have complete and up-to-date flood hazard maps to identify flood hazard areas throughout the province.
- The department produces technically sound flood hazard maps. However, the department's mapping guidelines have not been updated to deal with all types of flood hazards.

Flood hazard maps

The department does not have complete and up-to-date flood hazard maps to identify flood hazard areas throughout the province. Under the Canada–Alberta program, the partners compiled a priority list of 66 candidate communities for flood hazard mapping. As of September 2014, the department has created 63 maps; 48 of them, covering 960 kilometres of river, are finalized. A recent review of Canadian floodplain mapping programs estimates that Alberta requires another 770 kilometres of river mapping to document its flood hazard areas.[11]

Several flood hazard maps have not been updated. Before 2013 the department's focus was on mapping new areas, not re-mapping high-risk areas. So about a third of the maps are more than 20 years old (see table below). These maps are for communities such as High River, Red Deer, Cochrane, Canmore, Vegreville, Bragg Creek, Slave Lake, Black Diamond, Turner Valley, Medicine Hat, Cardston

[10] Flood Hazard Identification Program Guidelines (July 2011), page 2.
[11] National Floodplain Mapping Assessment (June 2014), MMM Group Ltd., page 33.

and St. Albert. As the department will be funding mitigation projects, it needs to update the maps to recognize subsequent development in the floodway or significant changes to topography or peak flow estimates.

AGE OF MAPS (in years)	NUMBER OF MAPS
0-5	9
5-10	14
10-15	7
15-20	12
20-25	19
>25	2
Total	**63**

The degree of community acceptance of flood hazard maps has varied, depending on local perceptions of risks. For example, Drumheller developed its own flood hazard maps based on regulated flows,[12] but its maps do not match the department's. Some communities did not participate in flood hazard mapping studies. For example, Peace River experienced flooding in 1992 and 1997 costing the governments of Canada and Alberta over $50 million, yet it did not participate in a flood hazard mapping study until recently.

Flood hazard mapping guidelines

The department produces technically sound flood hazard maps. However, the department's mapping guidelines have not been updated to deal with all types of flood hazards. The guidelines cover flooding caused by overland flow from a water body (such as a river or lake) caused by excessive flow or an ice jam. They do not cover geo-hazard events such as debris flows or debris floods,[13] or the risk that erosion and rapid channel change will cause flooding. The 2013 flooding of Cougar Creek in Canmore was significantly impacted by debris in the river, which shows the danger of not considering all flood hazards.

The department's mapping program had inconsistent funding over the years. The current flood mitigation plan's allocation of $8.7 million aims to resolve the shortcomings in identifying flood hazards. But despite the new funding, policy uncertainties have limited the department's progress on flood hazard mapping initiatives. Department employees know they need to update the guidelines, but cannot proceed effectively until the policy uncertainties are resolved, including:

- how to manage the consequences of changes to flood hazard areas in communities that are already mapped
- whether special allowances should be made for areas protected by dikes and berms
- whether the current level of acceptable risk is appropriate

Implications and risks if recommendation not implemented

The department cannot adequately protect people and communities from floods and their effects without current and complete information on flood hazards.

[12] Regulated flow assumes that existing flood control infrastructure is working effectively to control flood levels.

[13] Debris flows and debris floods represent an extension of the stream flow process with much higher sediment to water ratios and different flow behaviours that reflect their origins in steeply-sloping mountain watersheds.

Assessing flood risk

Background

Many jurisdictions throughout Canada and around the world use flood risk assessment as a tool to support flood mitigation decisions. The words "hazard" and "risk" are often used interchangeably, although they are different concepts. A hazard is an event that can harm society, infrastructure or the environment. Risk is a function of both a hazard and its consequences. Consequences of a flood hazard could include lives lost, injuries, property damage, business interruption, environmental degradation, population displacement and disruption of social services.

Risk assessment is the process of estimating the probability of hazards, determining the consequences for each hazard, and combining results to estimate the expected risk. The table below shows a qualitative example of how risk depends on both the probability and the consequences of hazards.

CONSEQUENCES	PROBABILITY OF HAZARD		
	Low	Moderate	High
Low	Low Risk	Low Risk	Moderate Risk
Moderate	Low Risk	Moderate Risk	High Risk
High	Moderate Risk	High Risk	High Risk

The results of a flood risk assessment are used to select the best of a number of flood mitigation alternatives. For example, decision makers may choose to mitigate a high risk flood area and choose not to spend money in a low risk area.

RECOMMENDATION 11: ASSESS RISK TO SUPPORT MITIGATION POLICIES AND SPENDING

We recommend that the Department of Environment and Sustainable Resource Development conduct risk assessments to support flood mitigation decisions.

Criteria: the standards for our audit

The department should have adequate processes to assess flood risks.

Our audit findings

KEY FINDINGS

- The department does not have the capacity to do flood risk assessments.
- The department does not have historical information on the consequences of previous floods such as lives lost, injuries, property damage and business interruption.

The department does not have what it needs to do flood risk assessments. It does not have historical information on the consequences of previous floods, such as lives lost, injuries, property damage and business interruption. For several decades the department's focus was modeling the flow of water and identifying the hazard through flood mapping. After the June 2013 floods the department determined that it lacked the damage information and tools to assess the consequences of previous floods.

The department hired external consultants to prepare cost benefit analyses for major flood mitigation infrastructure projects such as the Springbank storage site and Highwood River diversion. The department's review found differences in the cost–benefit methodologies used to evaluate the projects. The department subsequently hired technical experts to build the provincial flood damage assessment model to estimate damage to building structures and contents. This model is due to be completed in

2015. The department can then use it to track the benefits of flood mitigation spending, and assess mitigation alternatives consistently.

Effective flood mitigation planning requires applying flood hazard identification and flood risk analysis tools at varying levels of complexity, specific to each situation. The Town of Canmore is an example of good flood risk assessment practices. Canmore's flood mitigation plan[14] involves three phases: understanding the hazard, assessing the risk and mitigating the risk. To assess the risk, it uses computer models to show where people and property are at risk, and it is quantifying these risks. Canmore is assessing where the risk is and what is at risk before it decides on flood mitigation.

Flood risk assessments can help stakeholders understand the trade-offs between mitigation alternatives. The department lacks the expertise to do flood risk assessment, but it recognizes the value of more expertise in this area.

Implications and risks if recommendation not implemented

The department cannot effectively develop flood mitigation strategies without current flood hazard and risk assessment information.

Managing future development in flood hazard areas

Background

The department's flood mitigation plan stresses the importance of keeping people away from the water rather than keeping the water away from the people.[15] People living and carrying on business in flood hazard areas, particularly in floodways, pose a public safety and financial risk. Governments can control these risks by restricting development in such areas.

The *Water Act*[16] authorizes the minister to, subject to regulations, designate (i.e., to mark or point out) any area of land in the province as a flood hazard area if there is or may be a threat to human life or property as a result of flooding. The minister may also specify acceptable land uses in the flood hazard area. The minister must consult with the local authority responsible for a proposed flood hazard area before making the designation.

Designation by the minister under Section 96 of the *Water Act* represents the department's formal acknowledgement of the flood hazard area. Once designated, the area's local authorities are expected to consider flood risk when planning and approving future development in those areas.

The *Municipal Government Act,*[17] amended in December 2013, also provides the Lieutenant Governor in Council with the power to regulate land use, by:

- controlling, regulating or prohibiting any use or development in a floodway
- exempting municipalities with significant development that already exists in a floodway

[14] Mountain Creek Hazard Mitigation Plan
[15] Respecting Our Rivers: Alberta's Approach to Flood Mitigation (April 2014), page 4.
[16] RSA 2000 Chapter W-3.
[17] RSA 2000 Chapter M-26, Section 693.1(1).

RECOMMENDATION 12: DESIGNATE FLOOD HAZARD AREAS AND COMPLETE FLOODWAY DEVELOPMENT REGULATION

To minimize public safety risk and to avoid unnecessary expenditure of public money, we recommend that the:

- Department of Environment and Sustainable Resource Development identify flood hazard areas for designation by the minister
- Department of Municipal Affairs:
  - establish processes for controlling, regulating or prohibiting future land use or development to control risk in designated flood hazard areas
  - put in place processes to enforce the regulatory requirements

We have made recommendations to two departments because both departments have complementary roles to mitigate flood risk by managing future development in floodways. ESRD is responsible for identifying Alberta's floodways through its flood hazard identification program. Municipal Affairs is responsible for developing regulations to control, regulate or prohibit development in floodways.

Criteria: the standards for our audit

The departments should use all available flood mitigation tools and options to manage flood risks.

Our audit findings

KEY FINDINGS

- Alberta has not had a consistent approach to managing development in flood hazard areas. Some municipalities restricted development in the floodway and others did not.
- Municipal Affairs has not finalized the supporting regulation for controlling, regulating or prohibiting any use or development of land in a floodway, or developed processes to implement and enforce it.

Through its flood hazard studies, the Department of Environment and Sustainable Resources has identified and mapped flood hazard areas. It has formally designated flood areas for less than half of 48 finalized flood hazard maps: 20 flood hazard areas were designated under the Canada–Alberta program and two were designated by the department under the *Water Act* over 10 years ago. The lack of designation often reflects a lack of local community support, and the department's reluctance to impose designation on a community that does not want it. Some communities may oppose restricting development in the floodway because these areas are desirable to develop. In some cases, communities have existing development in flood hazard areas.

In May 1994 the department finalized the flood hazard maps for Hinton. In March 1995 the town rejected designation as it did not see any clear benefits of doing so. Under the Canada–Alberta program, the department recommended that areas of land within Drumheller and Fort McMurray be designated, but they were not. Currently, these two communities have substantial development, including their town centres, within the floodway.

Simply identifying land as being in the floodway—without changes to provincial legislation and regulations and municipal by-laws—will not restrict new development in floodways. Municipalities have not been required to deal with flood hazard areas in their land use by-law. This led to inconsistent by-laws across the province; some municipalities restricted development in the floodway and others did not.

In December 2013 the Legislative Assembly enacted the *Flood Recovery and Reconstruction Act*, with the goal of preventing further inappropriate development on land within the floodway.[18] That act amended the *Municipal Government Act* to give the Lieutenant Governor in Council the power to make regulations for controlling, regulating and prohibiting any use or development of land in a floodway. It also has provisions to exempt floodway development in municipalities with significant existing development such as Fort McMurray and Drumheller. The Department of Municipal Affairs completed its consultations with stakeholders in November 2014. The department is currently drafting the *Floodway Development Regulation* and expects it will be ready in spring 2015.

The government is spending significant amounts of money to build engineered flood mitigation structures to protect existing development in floodways. The following example illustrates the importance of designating flood hazard areas and restricting development in floodways—and the high cost of not making the designation. A neighbourhood in High River was developed on land that had already been identified as a flood hazard area through the department's flood mapping program. The land was not provincially designated as a flood risk area and restrictions were not placed on its use. After the June 2013 flood, the Department of Infrastructure purchased all homes in this neighbourhood at a cost of approximately $21 million under its home buyout program. Had the area been designated as a floodway and development prohibited, the province could have avoided spending these funds.

The Government of Alberta spent $72 million on its voluntary floodway relocation compensation program for the year ended March 31, 2014 and forecasts an additional cost of $55 million for the year ended March 31, 2015. The program was designed to relocate people out of the floodway by purchasing about 250 homes in southern Alberta, including those purchased in High River.

Implications and risks if recommendation not implemented

Allowing development in floodways unnecessarily risks public safety and the public purse. Keeping people and infrastructure away from floodways is the most cost effective approach to managing flood risk in areas where experts can predict water flows will be deepest, fastest and most destructive.

Assessing the effects of flood mitigation actions

Background

The department is taking steps through various flood mitigation programs to reduce or avoid the effects of flooding and minimize the damage it causes. These mitigation programs, which include structural and non-structural projects are:

- **Flood Recovery Erosion Control Program**—provides funding to deal with immediate critical erosion control projects and priority flood mitigation projects identified by individual communities
- **Alberta Community Resilience Program**—provides grants to develop projects that provide long-term mitigation from the consequences of flood and drought
- **Floodway Relocation Program**—acquires property in floodways to enable homeowners to move outside of the floodway. Homeowners who choose to stay in the floodway are ineligible for disaster assistance after future floods
- **Water Management Infrastructure**—funds upgrades to water management infrastructure to protect them from failure during significant flood events

Other flood mitigation initiatives include the Water Resiliency and Restoration Program to improve natural watershed functions, and the development of Major Mitigation Infrastructure such as storage sites and diversion tunnels. (See Appendix A for a breakdown of the funding for these programs.)

[18] Overview of Bill 27, Floodway Development Regulation Consultation, Department of Municipal Affairs.

RECOMMENDATION 13: ASSESS EFFECTS OF FLOOD MITIGATION ACTIONS

We recommend that the Department of Environment and Sustainable Resource Development establish processes to assess what will be the cumulative effect of flood mitigation actions in communities when approving new projects and initiatives.

Criteria: the standards for our audit

The department should have systems to allocate resources to areas of greatest impact and consequence.

Our audit findings

KEY FINDING

The department does not have adequate processes to assess what will be the cumulative effect of flood mitigation programs and initiatives within communities when it approves new projects.

The department does not have a planned approach to assess the cumulative effects of its flood mitigation actions. The department's management agreed that they could improve its processes to assess the overall effect of flood mitigation programs and determine whether communities were receiving too much or too little assistance to understand and mitigate flood risks.

We found that flood mitigation actions were implemented independently through various flood programs without a full consideration of whether a community was already adequately protected by existing programs and initiatives. For example, the Department of Infrastructure purchased homes in High River under the floodway relocation program. At the same time, ESRD approved funding for a new dike system. High River has now asked the government to make those properties available for sale to the public again because it believes the new dike system has reduced the risk for those properties.

Assessing what will be the cumulative effect of mitigation initiatives, while planning and approving them, is an essential step in allocating scarce resources and ensuring that communities receive appropriate flood mitigation assistance. The department plans to improve this process in its 2015–2020 Operational Plan for its Resilience and Mitigation Team. The team plans to implement the best combination of upstream, local and individual mitigation measures focusing on river basins with the highest flooding risks. The team's operational objectives include:

- engaging key stakeholders and understanding their needs
- developing an integrated approach to watershed mitigation
- working collaboratively to develop flood mitigation plans
- working with municipalities to assess the risks and mitigation initiatives that make economic sense

The department's flood mitigation practices are evolving—moving from recovery planning to future planning. The evolution is not complete. The department should build on the early stages of this transition as it continues to approve flood mitigation projects and initiatives in communities.

Implications and risks if recommendation not implemented

If the department does not assess the cumulative effect of flood mitigation programs and initiatives prior to approving new ones, some communities may be over protected and others under protected from future floods.

APPENDIX A

FLOOD MITIGATION FUNDING

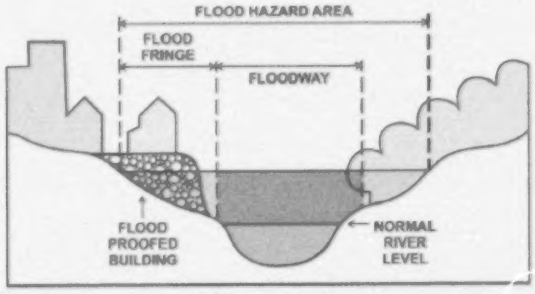
MITIGATION PROGRAM/ INITIATIVE[19]	MINISTRY	APPROVED FUNDING ($ millions)
Alberta community resilience program (Part I)	ESRD	325
Flood recovery erosion control program	ESRD	216
Alberta community resilience program (Part II)	ESRD	156
Floodway relocation program - Southern Alberta	Infrastructure	137
Water management infrastructure	ESRD / Transportation	110
Provincial park restoration and flood mitigation	ESRD	81
Engineering and design for the Springbank storage site	ESRD	75
Engineering and design for the Highwood River diversion	ESRD	75
Mitigation of highway system infrastructure	Transportation	70
Floodway relocation program - Wallaceville	ESRD	38
Berms and mitigation plan for High River	ESRD	29
Funding to southern Alberta communities to prepare for the 2014 flood season	Municipal Affairs	27
Water Resiliency and Restoration Program	ESRD	21
Restoration of damaged schools in High River and Calgary	Education	20
Engineering and feasibility studies of flood mitigation projects	ESRD	14
Flood hazard mapping	ESRD	9
Other programs and initiatives under $10 million	Various	39
TOTAL		**$ 1,442**

[19] This list does not include the potential costs of developing major mitigation infrastructure such as the Springbank storage site ($214 million), McLean Creek storage site ($294 million), Glenmore Reservoir diversion tunnel ($500 million) and Highwood River diversion ($260 million).

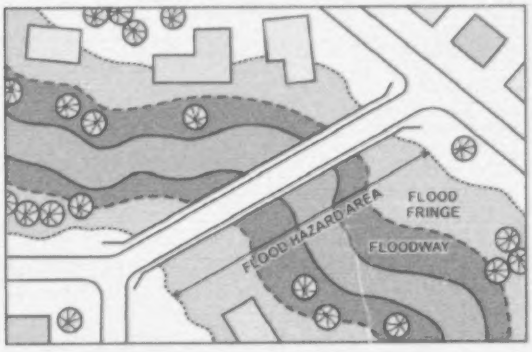
APPENDIX B

FLOOD HAZARD AREA AND DEFINITIONS

Flood Hazard Area[20]—The flood hazard area is the area of land affected by the design flood.[21] It is typically divided into two zones, the floodway and the flood fringe.



Cross-section view of a flood hazard area[22]



Aerial view of a flood hazard area[23]

Floodway—The floodway typically includes the river channel and adjacent overbank areas of the design flood where:

- water is 1 metre deep or greater
- local velocities are 1 metre/second or faster
- the water level is 0.3 metre or more above normal

Flows are deepest, fastest and most destructive in the floodway.

Flood fringe—The fringe is the land along the edges of the flood hazard area not included in the floodway. The fringe has relatively shallow water (less than 1 metre deep) with lower velocities (less than 1 metre/second).

---

[20] Alberta flood hazard maps can be found at www.environfo.gov.ab.ca/FloodHazard.

[21] The current standard in Alberta is the one per cent flood. Although it can be referred to as a 100-year flood, this does not mean that it will only occur once every hundred years.

[22] http://esrd.alberta.ca/water/programs-and-services/flood-hazard-identification-program/documents/FH-IdentificationProgram-Dec10-2014.pdf

[23] Ibid.

Environment and Sustainable Resource Development—Systems to Regulate Dam Safety

SUMMARY

What we examined

Responsibility for the structural integrity and safety of dams rests with the dam owner. The Department of Environment and Sustainable Resource Development is responsible for regulating the safety of dams, including dams the department owns. Regulatory activities don't eliminate the risk of dam failure, but if processes are designed and operating effectively, that risk can be reduced—ideally, to an acceptable level. In the department, the Dam Safety group is responsible for regulating the safety of dams in Alberta.

Our audit was designed to determine whether the department has adequate systems to regulate dam safety in Alberta. Our approach included assessing whether important regulatory processes, such as monitoring, were in place and whether they were operating as intended. As part of our audit, we also focused additional attention on the dam safety regulatory processes applied to tailings ponds (considered dams based on regulatory definition) due to the nature of the structures and the contents that they store.

During the period of the audit, two significant events impacting dam safety occurred:

- The failure of a dam storing tailings at Obed Mountain Mine occurred in October 2013. Because the incident at Obed constitutes a dam failure, it provided a relevant example for examining how the department's regulatory processes performed.
- Alberta experienced unprecedented flooding in the spring of 2013. The flooding raised concerns about potential damage and added strain on dams in the flood zone. We explored what role the department played, as dam regulator, in carrying out the necessary work to identify and monitor potential risks to the dams impacted.

What we found

The department does not have adequate systems to regulate dam safety in Alberta. A number of improvements to dam safety regulatory processes are needed. We found that critical elements of a well-functioning regulator are either not being performed or evidence is lacking that processes are being carried out as intended. This highlights the importance of a plan for dam safety outlining what needs to be done, who is doing it, what resources are required, and the implications of not carrying out certain activities. At present, the department is not completing foundational activities like a plan and the reporting of the results of regulatory activities.

The department's senior executive is not receiving the necessary information to assert that dams in Alberta are being appropriately regulated. At the most basic level, reporting should allow important questions to be answered, such as: Has the department completed enough work and received enough information from dam owners to conclude on the safety of dams? Are changes needed to regulatory activities based on risks identified? Currently, no performance metrics, results analysis or identification of areas for future improvement are being prepared on dam safety in Alberta.

At the process level, the department lacks a requirement for Dam Safety to document its work. Dam Safety attends inspections and reviews information from dam owners; however, the nature, frequency and the quality of this work cannot be verified appropriately, either by supervisors or outside scrutiny, as documentary evidence is lacking. Appropriately evidencing work is not a "nice to have" or simply a matter of initialling a piece of paper. Evidence provides a foundation for important decisions and supports the quality of work performed, especially in the face of challenges or significant events.

While the department does have a registry for dams, its completeness, accuracy and sustainability is lacking. At present, the database is not updated appropriately, information is missing, and is not being used to its full potential. For example, it is capable of but is not used to track inspections and deficiencies.

Dam Safety's regulatory activities are primarily influenced by the consequence ratings of dams determined by dam owners. If the consequence rating for a dam is not significant or very high, Dam Safety's reporting requirements range from minimal to none. We found dams and coal mine tailing ponds where the consequence rating was outdated, increasing the risk that the appropriate level of monitoring is not always taking place.

We found that coal mine tailing ponds have not been appropriately monitored by Dam Safety. The majority of coal mine tailing ponds hadn't been inspected by Dam Safety since the 1980s and 1990s. Our examination of the monitoring of Obed Mountain Mine identified that the main tailings pond was inspected by Dam Safety in 2013, but the structure that failed on the mine site was not monitored by Dam Safety even though it appears to meet the definition of a dam.

What needs to be done

The department must determine whether its dam regulatory activities are achieving the intended outcomes. Our recommendations highlight what we believe to be important areas that the department should focus on to improve its systems for regulating dam safety. This improvement begins with a reliable registry, a plan for carrying out work, and informative reporting on dam safety in Alberta. Of critical importance, the department must also document its regulatory activities. Without this evidence, the department can't prove it is doing what it should and fully support any conclusions that it makes regarding dam safety. And finally, the department needs to obtain sufficient information to assess the risks and consequences of dam failure, as this determines the extent of monitoring conducted.

Why this is important to Albertans

Dams can pose a significant risk to those living downstream as well as to the environment and economy if they are not maintained and operated correctly. Dams can fail or malfunction, resulting in release of water and any other substances in the water. Although dam failures are infrequent, the impacts can be catastrophic, often far exceeding typical river flood events.

All forms of mining, whether it is coal, oil, uranium, potash or gold, produce tailings. Coal and bituminous sand are the principal outputs of mines in Alberta. Nearly half of Canada's coal production is mined in the province. Tailing pond dams can have a significant impact on the environment, the wildlife and water quality. In just the last couple of years, two tailings ponds in Canada have breached.

AUDIT OBJECTIVE AND SCOPE

Our objective was to determine whether the department has adequate systems to regulate dam safety in Alberta. Adequate means that the department must be able to assert that it has identified any unsafe dams and has processes to monitor dam owners' management of the dams until the deficiencies are corrected. Unsafe dams are dams with deficiencies of such a nature that, if not corrected or managed, could result in the failure of the dam with potential subsequent loss of lives or substantial environmental and economic losses.[1]

We examined the department's regulating of dam safety during the period January 1, 2013 to March 31, 2014. We conducted our field work from January to October 2014. We substantially completed our audit on November 30, 2014. Our audit was conducted in accordance with the *Auditor General Act* and the standards for assurance engagements set by the Chartered Professional Accountants of Canada.

BACKGROUND

Irrigation, flood control and tailings storage are among the most common uses for dams in Alberta. Therefore, dams play an important role for the economy, human safety, protection of property and the environment. There are over 1,500 dams in Alberta, varying in size, use and scope, including a number of tailings dams used primarily in the mining industry. A dam is constructed for the purpose of storing water, including water containing any other substance. Dams impound water for such uses as irrigation, electric-power generation, human consumption and flood control. They can also be constructed to store mine tailings, which are a mixture of fine mineral particles and water. Tailings pond dams are designed and built to prevent the uncontrolled release of tailings into the environment. These structures can include berms, dikes, in-pits and dug pits.

In order to construct and operate a dam in Alberta, an owner must have an approval and a licence from the department.[2] If the capacity of a structure is 30,000 cubic metres or more and at least 2.5 metres high, it is considered a dam, and the dam owner or operator must also comply with the *Water (Ministerial) Regulation*.[3] The department's records, at March 31, 2014, report 1,395 privately owned and 150 government owned dams in Alberta that are subject to the regulation. Part 6 of the regulation, dam and canal safety, requires dam owners to immediately inform all relevant authorities, including Dam Safety, of any conditions that could be hazardous to a dam and public safety. In the department, the dam safety manager has been named as a director for purposes of part 6 of the regulation.

With regards to the department's role, the regulation is non-prescriptive in nature. It gives the dam safety manager the authority to require the dam owner to submit any information needed to assess the condition of the dam. The dam safety manager also has the authority to require the dam owner to repair the dam, have safety assessments done or even suspend operations of the dam.

---

[1] US Code of Federal Regulations, Corps of Engineers, US Department of the Army, Title 33 (Parts 200 –end), Navigation and Navigable Waters, Chapter II, Part 222.6, Page 308.

[2] 62/2013

[3] On dam and canal safety.

RECOMMENDATION AND FINDINGS

Developing a plan to regulate dams and corresponding reporting of results

Background

The department's Dam Safety group carries out regulatory activities for both publicly and privately owned dams; additionally, Dam Safety also provides support for the operation of government owned dams. At present, Dam Safety has eight full-time equivalent employees performing regulatory functions as well as supporting government owned dams.

A plan, in a regulatory context, is critical for outlining "how" compliance will be monitored. This would include strategies for achieving compliance (e.g., document submission, inspection), risk assessment, targeted coverage of the dam population and frequencies of work performed. A plan should also include staffing levels, budget and information technology requirements. Ideally, it should be designed to include both strategic (long range goals) and operational components.

Reporting, including an analysis of results, metrics on performance, and lessons learned, is the corresponding piece to a well-prepared plan. It helps coalesce and summarize all the work performed, assess whether objectives and priorities have been fulfilled, and if not, what may need to change in the future. Importantly, it enables those in charge of oversight to conclude whether dam safety is being appropriately regulated.

RECOMMENDATION 14: DEVELOP PLAN TO REGULATE DAMS

We recommend that the Department of Environment and Sustainable Resource Development develop a plan to regulate dams and report on the results of its regulatory activities.

Our audit criteria

For effective regulation of dam safety, the department should:

- establish the goals and objectives of the regulatory function
- develop a plan that lays out how the department will assess whether dams are safe and operated safely
- report to executive management on the results of regulatory work.

Our audit findings

KEY FINDINGS

- The department does not have a plan to perform its regulating activities.
- Dam Safety spends the majority of its time assisting with government owned dams.
- Oversight of regulatory activities is insufficient.
- Public information on dam safety in Alberta is limited.

A plan for regulatory activities is not in place

The primary purpose of a dam regulator is to verify that dam owners are carrying out their responsibilities to ensure the safety of dams they operate. A regulatory framework for dam safety in Alberta exists. Legislation is in place to enable Dam Safety to carry out regulatory work. However, Dam Safety does not have a plan that outlines what regulatory activities will enable it to assert that dam owners are doing what they should to ensure the safety of dams. In other words, a description of the goals, priorities, risks and activities planned to assess how dam owners are performing and whether dams are safe and operated safely has not been documented.

Dam Safety also needs this plan to outline the resources it requires to conduct the necessary monitoring, and if those resources aren't available, what tasks can't be completed, have to be deferred, or aren't necessary. Throughout the audit, we got the sense that Dam Safety is pulled in many directions; much-needed improvements in its processes take a back seat to day-to-day responsibilities. While resource constraints are a factor, a catch-22 also emerges: process improvements can enhance the efficient use of resources, but resources aren't available to make the necessary improvements. Thus, the department should clearly establish what the priorities are and what is expected of Dam Safety.

Dam Safety's monitoring plan does not consider all dams. Dam Safety performs inspections where the dam owner does not have the expertise or training or do the inspection. However, there is no list of which dams are monitored under the small dam inspection program. We noted that Dam Safety does not plan to inspect about 650 dams unless requested by the owner.

Dam Safety spends the majority of its time assisting with government owned dams

Dam Safety is responsible for activities related to the safety of the department's dams, such as contracting for dam safety reviews and performing inspections. This work is unquestionably important, but it also results in limiting the time directed at regulating the safety of both private and public dams. Dam Safety analyzed how it spends its time and found that safety engineers spend over half of their time assisting with government owned dams. The time required to perform these other key tasks should be well understood in the planning process because it impacts the time available for the necessary regulatory activities.

The department should also be aware that Dam Safety could be or appear to be in a conflict of interest because it assists government owned dams and is expected to regulate those same dams. Dam Safety reports to a director of infrastructure operations who is responsible for the government dams. The effectiveness of a regulatory function is potentially comprised if individuals are performing some of the functions of the dam owner and then regulating those same structures. Therefore, appropriate divisions or "firewalls" should be in place to protect against any actual or perceived conflict. While the department has created such divisions from an information technology perspective, it has not demonstrated how it has done this from a personnel perspective.

Oversight of dam safety regulatory activities is insufficient

We found little evidence that executive management is receiving the necessary information to apply effective oversight of dam safety. Executive management confirmed that consistent and informative reporting from the Dam Safety group is not taking place. Fundamentally, the information is not being provided to allow executive management to assert:

- that regulatory activities are being carried out as intended
- that the department understands the impacts of those activities
- whether any changes are necessary to improve its oversight of dam safety

Dam Safety did provided us with examples of ad hoc briefing notes prepared for executive management that highlight when significant events emerge (e.g., flooding). This is important, but does not preclude the need for consistent sharing of information about the results of Dam Safety's work.

At present, the department does not have a way to measure the success of dam regulation, or lack thereof. Certainly, the absence of any critical incidents is a vitally important indicator of success, but interpreted in isolation, it is a purely reactive signal.

Public information on dam safety is limited

The department's website does not have information on the location of dams, contact information for questions or concerns about dams, guidance to Albertans on public safety precautions required for dams or what someone should do if faced with a dam related emergency. In the past this information was available, but it was unclear to us why it was removed.

Implications and risks if recommendation not implemented

Without a plan, the department is likely to use its resources inefficiently or ineffectively. Without a report, the minister and public cannot hold the department accountable for its regulatory responsibilities.

Improving dam regulatory activities

Background

Under the current legislation, the Dam Safety group has discretion to decide how to regulate dam safety in Alberta. But Dam Safety does not determine the consequence of a dam failure with respect to loss of life, the environment, infrastructure and the economy; dam owners are required to do that. The owner's consequence classification drives the extent of work performed by Dam Safety and dictates what dam owners must submit or complete. Consequence ratings are used to determine whether Dam Safety attends the dam owner's inspection.

Dam owners may be requested by Dam Safety to:

- submit a dam safety review performed by independent engineers to assess the safety of the dam and identify safety deficiencies
- submit an Annual Performance Report that confirms the safety of the dam or the dam owner's progress in correcting deficiencies
- inspect the dam annually or at any time
- submit an operational plan describing how they will manage a safety deficiency until it is corrected

Dam Safety may also perform the inspection. Dam Safety has a small dam inspection program in which Dam Safety staff inspect dams about every 10 years. The department does not have a list of small dams. What distinguishes these dams is not simply size but rather the ability of the dam owner to perform the inspection, that is, expertise and training necessary to perform the inspection.

The department is responsible for regulating the structural safety of oilsands and coal mine tailings ponds in accordance with the 1994 Dam Safety Accord and the 1996 Memorandum of Understanding between the former ERCB and the Department of Environment and Sustainable Resource Development. These documents define responsibilities of Dam Safety in the context of coal and oilsand tailings ponds. Effective April 1, 2014, the responsibility for performing the monitoring of the safety of tailings ponds at oilsand and coal mine sites began to be transferred to the Alberta Energy Regulator. This process is still underway.

RECOMMENDATION 15: IMPROVE DAM REGULATORY ACTIVITIES

We recommend that the Department of Environment and Sustainable Resource Development improve its dam regulatory activities by:

- maintaining a reliable registry of dams
- obtaining sufficient information to assess the risk and consequences of dam failure
- retaining evidence of regulatory activities performed
- following up to ensure that owners correct deficiencies or manage them until they are corrected

Our audit criteria

For effective regulation of dam safety the department should:

- have a complete and accurate inventory of dams that are subject to regulation
- retain sufficient and appropriate evidence of regulatory work completed
- follow up to ensure that owners correct the deficiencies or manage them until they are corrected

Our audit findings

KEY FINDINGS

- The dam registry is missing information and is out of date.
- Consequence ratings for some dams and coal mine tailing ponds are outdated.
- Coal mining tailing ponds are not appropriately monitored.
- Documentary evidence of many regulatory tasks was lacking.
- Better clarity on deficiency reporting and tracking deficiencies is needed.
- Update to guidelines provided to dam owners is currently underway.

Registry of dams is missing information and is out of date

One of the basic requirements for a regulator is to have a complete and accurate registry. We found that Dam Safety's database is missing pertinent information and is not updated appropriately. Dam Safety cannot produce a current, comprehensive and consolidated listing of all dams in Alberta. Location information for 84 dams and consequence classifications for 956 dams was missing from the database. Dam Safety stated that these dams don't have consequence classifications because they are "small dams." However, Dam Safety did not have supporting information to verify this claim. Furthermore, updating of the database is inconsistent. Important tracking information, such as inspection dates, cannot be relied upon because information isn't updated consistently. While examining the department's processes for regulating the safety of small dams, we found the department had a list that reported approximately 100 dams had been inspected in 2013, but only 66 of those dams had inspection dates in the database. Through our discussions with Dam Safety, it was acknowledged that considerable time and effort will be required to update the database.

In order to determine whether any dams were missing from the database, we selected a sample of water licences issued for structures that met the definition of a dam. We identified one tailings pond that was not included in Dam Safety's database. Dam Safety agreed that they should have been regulating the tailings pond but the licence had not been provided to Dam Safety by the department's licensing staff.

The missing information and the lack of rigor in updating the database renders the database less useful and increases the risk that incorrect information is relied upon. The department also maintains another system where it keeps records on government owned dams.

Consequence ratings for some dams and tailing ponds are out of date

For dams where Dam Safety does not have a recent dam safety review, the consequence ratings provided by dam owners may be outdated. For example, the size of the dam may have changed. Tailing ponds may grow over a number of years as the need for tailings storage increases. Dam Safety has not asked dam owners to confirm whether the consequence rating is appropriate. Because the consequence rating impacts the extent of monitoring, this is potentially a significant risk.

Coal mine tailing ponds are not appropriately monitored

The department's registry at March 31, 2014 includes 16 licences with 22 dams at coal mining sites – some of the structures are described as tailings ponds and a variety of other descriptions, including lake dam, pre-settling and sediment dam.

We found that most coal mine tailing ponds haven't been inspected by Dam Safety since the 1980s and 1990s. Further, the department did not have on file any of the dam safety reviews for the 22 coal mine tailing ponds. Thus, the present consequence ratings are not informed by any type of current review. Overall, the monitoring of structures by Dam Safety on coal mine sites has been inadequate.

Dam Safety selected two coal mine tailing ponds to inspect during 2013. One selection was the main tailings pond at the Obed Mountain Mine in August 2013, which we detail below. The other licence selected for inspection was a mine site that had been previously reclaimed; thus, it was erroneously in Dam Safety's database.

Obed Mountain Mine was not appropriately monitored by Dam Safety

On October 31, 2013, a structural failure of the "Green Pit" caused the wastewater in it to flow into the Main Tailings Pond, which then overtopped, while some of the mine wastewater in the Green Pit discharged directly into the environment.[4] This released water containing coal tailings into the Athabasca River. As of February 2015, the government has not released its report on the cause of the structural failure of the Green Pit. The Obed Mountain Mine began operations in 1984. Fluctuating coal prices resulted in the mine closing in 2003, reopening in 2009, and closing again in 2012. At the time of the breach in October 2013, the mine was operating at reduced capacity.

We verified that the department registry included the main tailings pond at the Obed Mountain Mine site, as well as three other structures. But the registry did not include the "Green Pit." Based on the volume and size of the structure, it appears to meet the definition of a dam. It is not clear why it is not on the registry.

Dam Safety inspected the main tailings pond in August 2013. We could not find any evidence that any other inspections were performed on the main tailings pond since 1996. No other structures at the mine were mentioned in the inspection report. The Dam Safety staff assigned to do the Obed inspection was a technologist, not an engineer, and did not have expertise or training with tailings pond structures. There was no safety review on file for the main tailings pond. Annual performance reports were not received for 2012 or 2013, even though this was a requirement of the most recent licence issued in 2011.

Evidence of regulatory activities performed is lacking

Dam Safety is collecting a significant volume of information from dam owners, including dam safety reviews and annual performance reports. However, the nature and extent of the analysis and review completed and the conclusions reached by Dam Safety on this information is not apparent. Dam Safety does not have a requirement for appropriate documentation of the work it has performed. In essence, Dam Safety cannot demonstrate to either internal or external scrutiny that it is carrying out its responsibilities.

[4] Environmental Protection and Enhancement Order No. EPO-2013/34-CR

This same issue applies to the attendance of inspections. For each of the inspections Dam Safety completed there was an accompanying inspection report that documented the work completed, findings, and conclusions. We could not verify whether the department attended dam owners' safety inspections because it does not have copies of the inspections it attended and did not document its attendance or conclusions. Based on discussions with Dam Safety staff, and other supporting information like expense claims, we believe the department is attending these inspections. However, the lack of documentation precludes the ability to assess the nature and outcome of Dam Safety's attendance at the inspections.

Better clarity on deficiency reporting and tracking of deficiencies is needed

The department does not specify what the dam safety review must include. However, we confirmed that most dam safety reviews were either prepared in accordance with the guidelines issued by the Canadian Dam Association or in accordance with the terms of the contract issued by the dam owner for the work. Dam Safety staff apply professional judgment to conclude whether the dam safety review was performed in accordance with best practices and includes sufficient information on the safety deficiencies identified.

We found that some dam safety reviews only list the deficiencies, some rank them in descending order of criticality, and some provide timelines by which the deficiency should be corrected. Thus, Dam Safety is not receiving deficiency information in a consistent and comparable form.

Even dam safety reviews prepared in accordance with the guidelines issued by the Canadian Dam Association are not required to provide timelines by which the deficiency should be corrected. They are only required to conclude whether:

1. all safety requirements are met,
2. some are not met, or
3. it is uncertain which are not met, and what the preparer would need in order to decide.

Through our analysis of dam safety reviews for the highest consequence dams, we noted about 200 safety deficiencies classified as high priority. Dam Safety did not have evidence of how it assessed whether the dam owner should correct the deficiency or take any other action. This information was not tracked on the registry or a central system and it was not clear how Dam Safety would follow up to ensure the dam owner was fulfilling their responsibilities.

Update of guidelines to dam owners is currently underway

Dam Safety communicates its requirements to dam owners through formal and informal communication, such as direct requests to dam owners, conditions that are included in licences, and workshops.

The department last issued guidelines to dam owners and operators in 1999, but acknowledged that the 1999 guidelines were outdated. In April 2014, the department contracted to update the 1999 guidelines. The department acknowledged that because "the regulation is not prescriptive, a set of guidelines should be provided to dam owners and operators so that they have a clear understanding of the Regulation and the regulatory requirements to ensure understanding of their roles and responsibilities to safely operate the dams." The department expects to have this work completed by March 31, 2015.

Implications and risks if recommendation not implemented

Without making these improvements to its processes the department cannot demonstrate it is fully meeting its regulatory responsibilities.

Response to 2013 floods

Background

Over the past 20 years, there have been five major flood events in Alberta – most recently in 2013. The department's Flood Response Coordination Plan (October 2007) describes its processes to prepare for and respond to floods. Dam Safety is responsible for having the necessary Emergency Preparedness Plans and tracking that post flood inspections were completed for dams with the highest failure consequence.

Our audit findings

Overall, Dam Safety fulfilled its requirements under the department's Flood Response Coordination Plan. Dam Safety used a mapping tool to identify all impacted dams in the flood zone and asked owners of the highest consequence dams to inspect the dams. In addition, Dam Safety also performed inspections of 64 private dams and assisted owners with inspections if the owner did not have the requisite expertise.

Stand-alone Systems Auditing—Follow-up Audit

REPORT OF THE AUDITOR GENERAL OF ALBERTA

March 2015

Innovation and Advanced Education—Medicine Hat College International Education Division Follow-up

SUMMARY

In July 2013[1] we reported the results of our audit of Medicine Hat College's systems to deliver, evaluate and report on its international education activities. We recommended the college improve:

- oversight by the board of governors of significant risks and compliance with governance policies
- strategic and operational objectives and planning
- program management and monitoring of program delivery and quality assurance processes
- controls for travel expenses, including enforcing its travel policy

The college has implemented our recommendations. Management has improved its systems to deliver international programming and manage related risks by:

- increasing the level of awareness and detail in reporting international education activities to the board, thus allowing the board to improve its oversight of the college's international activities
- redefining goals and targets of international education activities to align with those of the college, allowing for increased monitoring against expected results
- redefining roles and responsibilities of the division
- cancelling its joint venture partnerships in China and improving its contract management practices
- revising its travel and expense policy and improving monitoring

These changes have improved the college's transparency and accountability for the results of its international education activities. The college stopped admitting new students at its offshore campuses in China and pursued an exit strategy that supports students to complete programs in progress.

Why this is important to Albertans

The Department of Innovation and Advanced Education has identified international education as an important building block for Alberta's economic and social success. Post-secondary institutions participating in international education activities need to do so with due consideration of the risks involved. The relationships they develop, and the transactions they engage in, must uphold the integrity of the institution. It is important that Albertans are assured that resources in our publicly funded institutions are used effectively within the mandates of those institutions.

[1] *Report of the Auditor General of Alberta–July 2013*, pages 55-80.

AUDIT OBJECTIVES AND SCOPE

Our audit objective was to determine if the college had implemented our recommendations. To perform the audit, we:

- interviewed management, staff and the board's audit committee members to learn what actions they took in response to our recommendations
- examined the college's systems, processes and policies for overseeing and delivering international programming
- tested the college's international travel for compliance with policy

We conducted our field work from July 2014 to November 2014. We substantially completed our audit on December 15, 2014. Our audit was done in accordance with the *Auditor General Act* and the standards for assurance engagements set by the Chartered Professional Accountants of Canada.

BACKGROUND

Recognizing the benefits of a diverse and knowledge-based global economy, Medicine Hat College made a commitment to globalize its institution starting in 2001. Over the years, this globalization progressed from recruiting international students to the college, to forming offshore partnerships in China and providing opportunities for students to study abroad. The 2013–2014 budget for international education activities was $1.5 million, approximately three per cent of the college's total budget.

FINDINGS AND RECOMMENDATIONS

Oversight and governance—implemented

Background

In 2013 we recommended that the college provide the board of governors with suitable and sufficient information about significant events and risks related to the college's international activities, and that the board of governors strengthen its processes to:

- ensure it is aware of significant risks the college faces
- monitor compliance of the college's international activities with the board's policies[2]

We found the board had not received enough information to properly assess the potential risks and costs of international education activities. The former president had not complied with the college's policy to limit international activity, and the board had no process in place to monitor the college's compliance with the policy.

Our audit findings

Board oversight over international activities has increased significantly, both qualitatively and quantitatively. Management's reporting to the board on significant events and risks in the college's international activities has improved through:

- quarterly reporting to the board on the college's international activities, including financial and non-financial information—The International Education Division presented its strategic plan for the board's approval. Management also reported key developments, such as the decision to stop admitting new students to offshore campuses and steps taken to resolve outstanding financial and contractual transactions with offshore partners, for the board's discussion and approval.

[2] *Report of the Auditor General of Alberta–July 2013*, no. 8, page 62.

- reporting to monitor compliance with each executive limitation policy, including the policy on international activities—Reporting consists of the president's assertion of her compliance and supporting data to demonstrate her compliance.
- a new board bylaw and policy review committee which will assist in ensuring the board receives appropriate information before it approves policy changes
- an institution-wide enterprise risk management process to provide ongoing risk assessment and reporting of significant risks to the board
- a new safe disclosure policy—Under this whistleblower policy, complainants can raise concerns free of reprisals and report possible wrongdoing.

Strategic and operational planning—implemented

Background

In 2013 we recommended the college implement systems to clearly define strategic and operational objectives of international education activities by:

- providing business cases that assess risks, benefits, costs and legal requirements before providing training in foreign countries
- setting clear and measurable targets for planned results
- periodically measuring and reporting on progress towards achieving targets and meeting objectives and desired results[3]

We found the college had not involved appropriate stakeholders in its International Education Division's strategic and operational planning processes. The college did not assess risks, benefits, costs and legal requirements associated with training in foreign countries, particularly with a contract to provide non-credit programs at one of its partnership campuses in China.

Our audit findings

Strategic and operational plans

In July 2014 the board approved a new strategic plan. The division used a comprehensive consultation process with internal stakeholders to develop its goals for internationalization and identified expected results. The plan reflects the college's current focus on winding down its offshore campuses and improving internal control and transparency for its international education activities. An update to the plan is expected in 2015. This demonstrates improved rigor around the college's strategic planning processes.

The college has set projections of zero growth for international student enrolment, based on historical enrolment results and its current retrenchment strategy. These targets align with the three-year institutional plan and are within the 15 per cent enrolment limit required by the executive limitation policy for international education activities. Measurement of actual enrolment is monitored by Student Services and reported annually to the board.

We were unable to assess if the international education strategic plan is aligned with the goals and objectives of the college's institutional strategic plan because the 2015–2020 institutional plan is currently being developed. We will examine, as part of our attest audit of the college's annual financial reporting, if the plans are aligned when the institutional strategic plan is completed.

To improve its operational planning processes, the college formed an International Education Action Team (IEAT) that included senior leadership from each area of the college. This team was responsible for

[3] *Report of the Auditor General of Alberta–July 2013*, no. 9, page 67.

overseeing the implementation of changes within the International Education Division. IEAT assessed key operational decisions using a business case format to identify risks, assess options and recommend a course of action. As a result, decision making for international education operations is now more formalized and operations are incorporated into established college systems and processes.

Training in foreign countries

The IEAT assessed the college's risks, costs and benefits of continuing its offshore partnerships. This included visiting each offshore campus in China, meeting with its partner institutions, consulting external legal counsel to understand the legal requirements of operating in China and the legal implications of terminating those partnerships. Through these processes, the IEAT recommended an exit strategy for its offshore partnerships, while continuing to support currently enrolled students to completion as the most appropriate course of action.

We reviewed correspondence in which the college confirmed an outstanding payment of $212,000 to one of its offshore partners had been processed and, therefore, was no longer an obligation of the college.

Program operations and monitoring—implemented

Background

In 2013 we recommended the college improve management of its international education operations by:

- assessing and clearly defining the roles and responsibilities of its International Education Division and re-aligning the structure and management of the division
- implementing effective program delivery and quality assurance processes at its offshore campuses
- implementing an appropriate system of internal controls, financial reporting and accountabilities for the results of its international education activities
- implementing contract management practices to ensure risks have been appropriately managed[4]

In 2013 we found the college had not appropriately segregated the recruiting and academic responsibilities for its International Education Division. We found several quality assurance problems at the college's offshore campuses in China and inadequate contract management practices. Financial reporting of international education operations did not include disclosure of all costs of operations.

Our audit findings

Academic oversight

Responsibilities to provide academic oversight have been re-aligned by:

- assigning responsibility for the International Education Division to the Division of Business and Enterprise
- assigning program leaders within appropriate faculties as the instructor of record over related offshore courses
- combining the college's International English as a Second Language with the college's ESL for New Canadians Program, under the responsibility of the college's Division of Arts and Education

[4] *Report of the Auditor General of Alberta–July 2013*, no. 10, page 72.

Offshore operations

Beginning in November 2013 senior staff and executives from the college travelled to China to assess offshore operations. Based on these visits, a quality assurance work plan was developed and implemented. Improvements to offshore operations include:

- increased controls around proctoring offshore exams
- responsibility taken by relevant program areas for exam grading and assessment to determine a student's final grade
- greater diligence to better understand the offshore instructor-provided portion of student grades
- review of and improvements to the format and grading of final exams

Despite these changes, the pass rate of students overseas has remained low. The trend of higher marks on the grade portion (40 per cent) based on course work in China and lower results on exams prepared by the college (60 per cent) remains. These risks were identified in the college's decision to cancel three offshore partnerships in China. The college is actively monitoring the residual risk that remains as these programs are wound down.

Financial reporting

The college improved financial reporting of international education operations by providing the board with quarterly reporting of financial results and highlights of operations. This reporting includes actual results to date and projections to year end, for comparison to budget. Costs not previously included in financial reporting, such as international travel by executives, legal and audit costs attributable to the division, are now reported to the board.

Contract management

The college improved its contract management of student recruitment agents and notified certain agents it was terminating their relationship. The college developed a new agent contract template, with advice from external legal consultants. It has begun the process of updating its contracts with approved agents.

The college is automating its agent commission payment process. As of November 2014 the process to calculate agent commissions remains largely manual. The college mitigates risks through added review from relevant areas of the college before commissions are approved and paid to agents. Our testing did not identify any errors.

International travel and recruitment expenses—implemented

Background

In 2013 we recommended that the college improve controls over travel expenses by enforcing its travel policy.[5] We found travel expense claim submissions were not complete and financial services was not able to assess the business purpose or reasonableness of expenditures. Travel itineraries were also incomplete and not submitted with expense claims. There was no reporting on the results achieved for the expenditures of the college's international travel.

[5] *Report of the Auditor General of Alberta–July 2013*, no. 11, page 77.

Our audit findings

Travel claims

In 2013 the college implemented a new travel and expense policy that increased requirements for travel claim submissions. We found pre-approval, a clearly stated business purpose for all international travel and original detailed support for all travel expenses we examined. We also examined instances where expenses were disallowed due to lack of appropriate supporting documentation. The level of scrutiny and independent review of expenses by Financial Services has improved.

The college's policy does not require completed travel itineraries to be submitted with expense claims. Including travel itineraries with expense claim submissions for extensive international travel trips is a best practice that would increase Financial Services' ability to independently confirm the reasonableness and business purpose of expenses.

Reporting on travel

Extensive reporting was done on international travel to China to assess the college's offshore campuses and administer exams. Longer duration overseas recruitment trips, which were common previously, have been limited.

Other Audit Work

REPORT OF THE AUDITOR GENERAL OF ALBERTA

March 2015

Innovation and Advanced Education —Report on Post-secondary Institutions

INTERNAL CONTROLS—A REPORT CARD

This report includes an update on the report card on internal controls over financial reporting, together with comparative assessments from our 2013 and 2012 audits of colleges, technical institutions, MacEwan University and Mount Royal University. Our October 2014 report provided our observations on Athabasca University, University of Alberta, University of Calgary and University of Lethbridge.[1]

To govern effectively, boards need accurate and timely financial information throughout the year, not just at year-end. To manage effectively, management needs the same information. We see a direct correlation between a strong year-end process to prepare financial statements and the ability to prepare quality financial information throughout the year. Strong, sustainable processes improve management's decision making ability and provide opportunities to use results analysis to communicate to Albertans the institution's performance and accountability for results. The Minister of Innovation and Advanced Education, through the department, must ensure the boards of governors of post-secondary institutions hold management accountable for sustaining strong internal control environments and improving identified control weaknesses in a reasonable period of time.

Consistent with our prior report cards, we evaluated the following key indicators of effective financial processes and internal controls:

- the time it took institutions to prepare complete and accurate year-end financial statements
- the quality of draft financial statements we received, including the number of errors our audit found
- the number and type of current and outstanding recommendations

A post-secondary institution could have a yellow or red status yet still receive an unqualified audit opinion on its financial statements as management can correct errors and financial statement disclosure deficiencies during the audit process. The number of errors and disclosure deficiencies we find in the draft financial statements indicates how effective financial controls are for preparing accurate financial statements.

Our conclusion on the status of outstanding recommendations considers not just the number, but also the age and nature of the outstanding recommendations. A summary of outstanding recommendations by institution is provided on page 117. Eleven of the 40 outstanding recommendations to institutions are aged greater than three years.

Effective control environments include clear policies, well-designed processes and controls to implement and monitor compliance with policies and secure information systems to provide timely and accurate financial and non-financial information to manage and govern the institutions. Recommendations that are not implemented promptly erode the effectiveness of the institution's control environment. Weak control environments impact the quality of decisions made by management and the board of governors. This can result in an institution not achieving its goals of operating in a cost-effective manner and managing operating risks.

[1] *Report of the Auditor General of Alberta—October 2014*, pages 155-171.

The report card

- ◆ Significant improvements are needed.

  Improvement is required, but not to the same extent as the red items. Yellow items may or may not be associated with a management letter recommendation. They represent areas where an institution can improve, as opposed to areas that require significant, immediate attention.
- ● We have not identified significant weaknesses in the control environment.

Institutions where improvements are needed

Institution	Financial statements preparation		Outstanding recommendations
	Accuracy	Timeliness	
Olds College			
2014	◆	◆	◆
2013	◆	◆	◆
2012	◆	●	◆
Northern Lakes College			
2014	◆	●	◆
2013	◆	◆	◆
2012	◆	◆	◆
Alberta College of Art + Design			
2014	●	●	
2013	◆		◆
2012	◆		◆
Lakeland College			
2014		●	●
2013	●	●	●
2012	●	●	●
Portage College			
2014	●	●	◆
2013	●	●	
2012	●	●	

Institutions with adequate internal controls and processes over financial reporting

Institution	Financial statements preparation: Accuracy	Financial statements preparation: Timeliness	Outstanding recommendations
Bow Valley College			
2014	●	●	●
2013		●	●
2012		●	●
Grande Prairie Regional College			
2014	●	●	●
2013		●	●
2012	●	●	●
Keyano College			
2014	●	●	●
2013		◆	●
2012	●		
MacEwan University			
2014	●	●	●
2013	●	●	
2012	●	●	
Medicine Hat College			
2014	●	●	●
2013	●	●	◆
2012	●	●	
Northern Alberta Institute of Technology			
2014	●	●	●
2013	●		●
2012	●	●	●
Lethbridge College			
2014	●	●	●
2013	●	●	●
2012	●	●	
Mount Royal University			
2014	●	●	●
2013	●	●	●
2012			
NorQuest College			
2014	●	●	●
2013	●	●	●
2012	◆		◆
Red Deer College			
2014	●	●	●
2013	●	●	
2012	●	●	
Southern Alberta Institute of Technology			
2014	●	●	●
2013	●	●	●
2012	●	●	●

In concluding on our report card, we noted the following:

Financial statements preparation

Each institution made improvements to internal controls and processes to promptly prepare reliable financial statements.

Alberta College of Art + Design significantly improved its financial reporting internal controls and processes in the year. As previously demonstrated at MacEwan University and NorQuest College, significant improvements to financial reporting processes can be possible in a short period of time if the board of governors holds management accountable for implementing and maintaining those processes.

Olds College and Northern Lakes College added more qualified individuals to their finance departments and began to revise controls and processes to improve their financial reporting. Significant improvements are still required to improve the financial reporting controls and processes at both institutions.

Unanticipated changes in an organization can impact management's ability to sustain strong financial reporting annually. Lakeland College had changes in key finance personnel which contributed to accuracy and disclosure deficiencies being identified in the college's draft financial reporting. We expect Lakeland College will restore effective financial reporting in fiscal 2015.

We issued unqualified audit opinions on the financial statements of all post-secondary institutions in fiscal 2014.

Outstanding recommendations

Alberta College of Art + Design significantly improved its overall internal control environment. The college implemented five of ten outstanding recommendations including a recommendation to improve financial reporting processes. The college must continue to focus on implementing its remaining recommendations in fiscal 2015.

MacEwan University, Medicine Hat College and Northern Lakes College also implemented numerous outstanding recommendations in the year, strengthening their overall internal control environments. Portage College reduced its outstanding recommendations by one during fiscal 2014 however, it must continue to focus on its remaining four outstanding recommendations, half of which were originally issued over three years ago.

Olds College and Northern Lakes College are the only institutions with an outstanding recommendation to significantly improve their financial reporting processes. We conclude that given the significance of those processes, immediate attention is required to implement improvements.

FINDINGS

There were no new or repeated recommendations to post-secondary institutions in fiscal 2014.

ALBERTA COLLEGE OF ART + DESIGN

SUMMARY

The college implemented our recommendations to:

- improve financial reporting processes—see below
- implement and enforce procedures for code of conduct and conflict of interest—see below
- improve risk management systems—see below
- improve internal controls at the bookstore—see page 112
- implement proper purchase controls—see page 112

FINDINGS

Matters from prior audits

Improve financial reporting processes—implemented

The college implemented our 2014 recommendation[2] (repeated from 2008 and 2010) to improve its processes and internal controls to increase the accuracy and efficiency of its financial reporting. The college implemented this by:

- strictly enforcing cut-off deadlines. This resulted in the timely preparation of financial statements and allowed management to complete detailed reviews of the financial statements before our audit.
- designing and operating processes to prepare reliable draft financial statements. As a result, our audit team found no significant errors in the course of the year-end audit.
- implementing good practices for financial statement presentation and disclosures

Our examination of these processes found them to operate effectively.

Implement and enforce procedures for codes of conduct and conflict of interest—implemented

The college implemented our 2014 recommendation[3] (repeated from 2011) to develop, implement and enforce procedures for code of conduct and conflict of interest by:

- developing and implementing procedures for code of conduct, conflict of interest and fraud
- enforcing procedures for acceptable business practices to ensure a sound control environment
- clearly stating who is accountable and what they are responsible for in complying with college procedures. This clear record of accountability is in the Confirmation of Understanding document that the college requires its staff to sign.

Our testing of enforcement processes found them to be adequate.

Improve risk management systems—implemented

The college implemented our 2012 recommendation[4] to develop an effective management process to manage and mitigate its risks. The college has implemented this by:

- finalizing its enterprise risk management framework document and annually updating it for changes
- implementing semi-annual reporting processes where the senior vice president, finance and corporate services presents a risk management report to the board of governors, on behalf of the president and chief executive officer, to comply with board policy

Our testing of these processes found them to be adequate.

---

[2] *Report of the Auditor General of Alberta—February 2014, no. 5, page 78.* (Originally April 2008, page 180; repeated April 2010, page 160).

[3] *Report of the Auditor General of Alberta—February 2014,* no. 6, page 79. (Originally April 2011, p. 72.)

[4] *Report of the Auditor General of Alberta—March 2012,* no. 3, page 19.

Improve internal controls at the bookstore—implemented

The college implemented our 2014 recommendation[5] (repeated from 2013) to improve deficiencies in its internal control systems at the bookstore, by:

- adequately segregating incompatible job duties
- having the finance department perform test counts quarterly to detect and investigate discrepancies between inventory counts and inventory records
- resolving software deficiencies in its inventory management computer application

Our examination of the bookstore controls identified no differences.

Implement proper purchase controls—implemented

The college implemented our 2014 recommendation[6] (repeated from 2013) to ensure purchases are appropriately supported by purchase requisitions and purchase orders, in accordance with its policies and procedures.

The college has implemented controls to ensure management consistently approves purchase orders and purchase requisitions before staff make purchases. Management also enforced staff compliance with the college's purchasing procedures.

Our examination of the controls identified no differences.

GRANDE PRAIRIE REGIONAL COLLEGE

FINDINGS

Matters from prior audit

Conflict of Interest Policy—implemented

The college implemented our 2013 recommendation[7] by:

- developing and implementing a new conflict of interest policy that defines when a conflict of interest exists and outlines the corresponding corrective action
- implementing a process for employees to annually declare that they have read the policy and disclosed potential conflicts of interest in writing, or to confirm that they are free from any conflicts of interest so that the college can manage the conflicts proactively

We noted that the college regularly follows up on outstanding declarations. We examined supporting documentation of the analysis performed, and where applicable, the corrective action taken, on a sample of conflicts identified.

Members of the board of governors do not make annual written declarations on conflicts of interest. All members are required to declare any conflicts of interest, if they arise, at board meetings held throughout the year.

MACEWAN UNIVERSITY

SUMMARY

The college implemented our recommendations to:

- improve its financial business process—see page 113
- improve security of its enterprise resource planning system—see page 113
- improve the process to ensure timely signing of contracts—see page 113

---

[5] *Report of the Auditor General of Alberta—February 2014*, no. 7, page 80. (Originally February 2013, no. 8, page 62.)
[6] *Report of the Auditor General of Alberta—February 2014*, no. 8, p. 81 (Originally February 2013, no. 12, page 67.)
[7] *Report of the Auditor General of Alberta—February 2013*, No. 14, page 72.

FINDINGS

Matters from prior audits

Improve financial business process—implemented

The university implemented our 2012 recommendation[8] to improve its financial business processes. Management has:

- established clearly documented processes and controls to avoid processing errors and incomplete financial records. We tested financial reporting controls and did not identify any control weaknesses.
- developed quarter and year-end close checklists outlining roles, responsibilities and timeline for each finance staff to prepare documents supporting the financial reports. We received working papers supporting the financial statements timely for our audit.
- provided on-the job training to accounting staff throughout the year. We noted that staff were familiar and knowledgeable with the policies, processes and controls surrounding the financial business process.
- implemented a monitoring and review process

We examined these processes and assessed them to be effective.

Improve security of the enterprise resource planning system—implemented

The university implemented our 2012 recommendation[9] to improve the security of its enterprise resource planning system by:

- limiting user access to the minimum needed for business purposes
- documenting and enforcing segregation of duties through defined roles
- limiting the use of powerful data entry modes

The university formalized its security standards and policies, reviewed existing roles and user permission lists and revised them to be in compliance with its documented standards and policies. We examined the documentation that management provided and assessed that they are adequate.

The university implemented a defined operational process to monitor security changes to maintain the integrity of the security controls. We obtained a log of data changes and tested a sample of changes. We noted that there was sufficient evidence of logging, approvals, separation of duties, testing and approval to implement the changes.

We conclude that management has adequate controls to manage the security of its enterprise resource planning system and the controls are operating effectively.

Improve the process to ensure timely signing of contracts—implemented

The university implemented our 2011 recommendation[10] (repeated from 2006) to improve the process to ensure timely signing of contracts. It establishes guidelines for procurement and contract services. If there is a need to proceed with the work prior to execution of the contracts, management will issue an interim letter of agreement. We tested a sample of contracts that the university entered and did not identify any exceptions to the university's guidelines.

Management told us that it is not always feasible to have signed contracts in place prior to service delivery. The undue delay may adversely affect its project delivery schedule. Management's approach to assess risk is on a case-by-case basis. If a signed contract cannot be in place prior to service delivery,

---

[8] *Report of the Auditor General of Alberta—March 2012*, no. 1, page 13.
[9] *Report of the Auditor General of Alberta—March 2012*, no. 2, page 15.
[10] *Report of the Auditor General of Alberta—April 2011*, no. 3, page 75. (Originally November 2006, no. 9, page 35.)

management will assess if certain work orders can commence without posing significant risks to the university and that the university can manage the risks within its acceptable parameters. We concur with management's rationale.

MEDICINE HAT COLLEGE

SUMMARY

The college implemented our recommendation to improve its enterprise risk management systems—see below.

The college also implemented our 2013 recommendations[11] relating to its international education programs—see page 99

FINDINGS

Matters from prior audits

Improve enterprise risk management systems—implemented

The college has implemented our 2012[12] recommendation to improve its risk assessment processes by:

- developing an enterprise risk management system based on a recognized international risk management standard
- creating a steering committee to oversee development and implementation of the enterprise risk management processes
- implementing a risk management policy which defines its risk management framework and institutional risk appetite
- identifying and documenting strategic, operational and financial risks the college faces, and process owners for key risk categories
- completing risk assessments for nine of thirteen risk categories, including assessing the likelihood and impact of identified risk, current controls and planned response for areas where the residual risk remained higher than the risk tolerance. The college will repeat this process until all risk categories have been formally assessed.
- reporting implementation progress to the audit committee regularly and developing processes to report assessed risks to the audit committee

We examined supporting documentation and approvals and concluded they were adequate.

NORQUEST COLLEGE

FINDINGS

Matters from prior audit

Contract management—implemented

The college implemented our 2012 recommendation[13] to improve its controls over contract management by developing and implementing:

- contract framework and specific procedures which provide guidance to staff
- contract templates to ensure consistency of language in all types of the college's contracts
- contract control form to improve the review and approval of contracts

We examined these documents and found them to be adequate.

---

[11] *Report of the Auditor General of Alberta—July 2013*, no. 8, page 62; no. 9, page 67; no. 10, page 72; and no. 11, page 77.
[12] *Report of the Auditor General of Alberta—March 2012*, no. 12, page 31.
[13] *Report of the Auditor General of Alberta—March 2012*, no. 5, page 23.

NORTHERN LAKES COLLEGE

SUMMARY

The college implemented our recommendations to:

- preserve endowment—see below
- improve controls over tuition revenue—see below
- establish an accounts receivable write off policy—see below

FINDINGS

Matters from prior audit

Preserving endowment—implemented

The college implemented our 2013[14] recommendation to define the college's goals for the use and preservation of the economic value of endowment assets. During the year the college developed a policy which adequately defined those terms.

Controls over tuition revenue—implemented

The college implemented our 2013[15] report recommendation to improve controls over tuition revenue. The college reviews that:

- the approved fee schedule entered into the system matches the board of governors approved fees
- individuals are appropriately assigned roles and levels of user access to the system

Our testing of these controls identified no differences.

Accounts receivable write off policy—implemented

The college implemented our 2013[16] report recommendation to establish an accounts receivable write off policy to ensure that balances are valid and appropriately valued. The college approved a policy that provides guidance on identifying accounts receivable write offs, collection efforts that need to be carried out prior to write off and write off approvals.

Our examination confirmed the bad debt expense and allowance for doubtful accounts were determined in accordance with the policy.

OLDS COLLEGE

FINDINGS

Matters from prior audit

Privileged user access—implemented

The college implemented our 2013 recommendation[17] (repeated from 2012) to segregate privileged systems access from data entry responsibilities and business functions.

College management stated that there are a limited number of staff within the college's business division. This prevents them from providing privileged user access to staff that do not enter financial data. With this limitation in mind, the college amended access for the two business staff that need privileged user and data entry access. They will continue to have separate user IDs for each role but data entry is possible with privileged user access. As a compensating control, the college developed monthly reports to confirm that no data entry takes place under the privileged user access. All changes

---

[14] *Report of the Auditor General of Alberta—February 2013*, no. 26, page 92.
[15] *Report of the Auditor General of Alberta—February 2013*, no. 27, page 93.
[16] *Report of the Auditor General of Alberta—February 2013*, no. 28, page 94.
[17] *Report of the Auditor General of Alberta—February 2013*, no. 30, page 96. (Originally March 2012, no. 9, page 28.)

in authority for privileged access are authorized in advance and documented. We tested a sample of those monthly reports and found no exceptions. In our view, this compensating control achieves the objective we recommended.

PORTAGE COLLEGE

FINDINGS

Matters from prior audit

Bookstore perpetual inventory system—implemented

The college implemented our 2014 recommendation[18] (repeated from 2011 and 2012) to improve the accuracy of its perpetual inventory system at the bookstore.

The college implemented our recommendation by:

- preparing year-end variance reports for inventory with review by the director of finance and administration
- updating the inventory system with the results from the physical inventory count
- restricting access to the bookstore from the general public by installing doors and security cameras
- inventory report and reconciliation are reviewed by chief financial officer

We examined the year-end variance reports, book-to-physical adjustments and improved controls, and concluded they were adequate.

SOUTHERN ALBERTA INSTITUTE OF TECHNOLOGY

FINDINGS

Matters from prior audit

IT strategic plan—implemented

The college implemented our 2013[19] recommendation to reassess and update its IT action plan and develop an effective process to identify, rank and prioritize all IT projects and update plans as needed. It implemented an IT project portfolio review process to identify and review all IT projects with senior management regularly throughout the year. We obtained evidence that this process:

- replaces the IT action plan that the college developed in prior years
- identifies the priority of IT projects and reprioritizes IT projects throughout the year as needed
- provides assurance to application and data owners and users that the IT group is meeting its IT project obligations

[18] *Report of the Auditor General of Alberta—February 2014*, no.10, page 88. (Originally April 2011, page 82; repeated March 2012, no. 15, page 34)

[19] *Report of the Auditor General of Alberta*—February 2013, no. 33, page 101.

OUTSTANDING RECOMMENDATIONS

Institution	Outstanding Recommendations 3+ Years*	Other	Total
Alberta College of Art + Design	-	5	5
Athabasca University	5	2	7
Bow Valley College	-	1	1
Grande Prairie Regional College	-	1	1
Keyano College	-	1	1
Lakeland College	-	1	1
Lethbridge College	-	1	1
MacEwan University	1	1	2
Medicine Hat College	-	1	1
Mount Royal University	-	1	1
NorQuest College	-	1	1
Northern Alberta Institute of Technology	-	1	1
Northern Lakes College**	-	2	2
Olds College**	1	1	2
Portage College	2	2	4
Red Deer College	-	2	2
Southern Alberta Institute of Technology	-	1	1
University of Alberta	1	1	2
University of Calgary	1	2	3
University of Lethbridge	-	1	1
Total Outstanding	11	29	40
Ready for follow-up audit***	4	8	12
Not yet ready for audit	7	21	28

* Originally issued in March 2012 report and earlier

** Outstanding recommendation to improve financial reporting processes

*** Based on management representations to March 3, 2015

The following is a detailed list of outstanding recommendations to public post-secondary institutions. The list does not include the University of Alberta, University of Calgary, University of Lethbridge, Athabasca University or the Department of Innovation and Advanced Education, which were included in our October 2014 report.

MULTI-INSTITUTIONAL RECOMMENDATION

Improve systems to ensure compliance with legislation—February 2013, no.7, p.60

We recommend that the post-secondary institutions[20] implement systems to:

- understand what legislation they must comply with
- develop appropriate policies, procedures and controls to ensure compliance with legislation
- monitor and report non-compliance to senior management and board audit committees

[20] As a result of our assessment, we made this common recommendation to all colleges and universities as part of our original audit in February 2013, and then followed up in October 2013 and February 2014.

ALBERTA COLLEGE OF ART + DESIGN

Improve systems to ensure compliance with legislation—see multi-institutional recommendation

Improve controls over contracts—February 2013, no. 9, p. 64
We recommend that Alberta College of Art + Design improve controls over contracts by:
- developing, documenting and enforcing contract procedures
- standardizing contracts with templates that ACAD's legal counsel approves
- developing systems to track and monitor all contracts prepared by all its departments

Implement a disaster recovery plan—February 2013, no. 10, p. 65
We recommend that Alberta College of Art + Design implement and test a disaster recovery plan.

Strengthen controls over procurement cards transactions—February 2013, no. 11, p. 66
We recommend that Alberta College of Art + Design strengthen its processes over the authorization, review and approval of procurement card transactions.

Improve controls over expense claims and purchase card transactions—February 2014, no. 4, p. 76
We recommend that Alberta College of Art + Design strengthen its controls over expense claims and purchase card transactions by:
- improving documentation to support the business reason for and cost effectiveness of expenses
- improving staff training on their responsibilities for complying with policies monitoring expenses and reporting results to the board

MACEWAN UNIVERSITY

Systems over costs for internal working sessions and hosting guests—April 2010, p. 165
We recommend that MacEwan University:
- implement policies and guidance on appropriate expenses for events related to internal working sessions and for hosting guests
- follow its policies and processes for employee expense claims and corporate credit cards

Improve systems to ensure compliance with legislation—see multi-institutional recommendation

NORTHERN LAKES COLLEGE

Improve systems to ensure compliance with legislation—see multi-institutional recommendation

Improve processes for year-end financial report—February 2014, no. 9, p. 87
We recommend that Northern Lakes College review the adequacy of its financial statements closing process and improve its ability to produce timely and accurate financial statements.

OLDS COLLEGE

Improve systems to ensure compliance with legislation—see multi-institutional recommendation

Improve systems on financial year-end reporting—February 2013, no. 29, p. 95 (Originally April 2011, p. 68; repeated March 2012, no. 8, p. 27)
We again recommend that Olds College further improve its processes and controls over year-end financial reporting.

PORTAGE COLLEGE

Follow access controls and remove access promptly—March 2012, no. 13, p. 32
We recommend that Portage College ensure that employees follow its system user-access control procedures and that management promptly removes access privileges when staff leave.

Develop and test a business resumption plan—March 2012, no. 14, p. 33
We recommend that Portage College fully develop and test a business resumption plan to ensure that it can resume IT services in a reasonable time after a disaster.

Improve systems to ensure compliance with legislation—see multi-institutional recommendation

Improve information system change management—February 2013, no. 31, p. 98
We recommend that Portage College develop and implement formal change management policies and control procedures to ensure all changes to systems and applications within the computing environment are implemented in a consistent and controlled manner.

RED DEER COLLEGE

Improve systems to ensure compliance with legislation—see multi-institutional recommendation

Improve general computer control environment—February 2013, no. 32, p. 100
We recommend that Red Deer College improve its general computer control environment by:

- finalizing its risk assessment process and implementing a comprehensive IT control and governance framework for its key processes
- implementing appropriate security over information and information technology assets
- managing changes to computer programs
- testing its disaster recovery plan and then assessing its adequacy

BOW VALLEY COLLEGE
GRANDE PRAIRIE REGIONAL COLLEGE
KEYANO COLLEGE
LAKELAND COLLEGE
LETHBRIDGE COLLEGE
MEDICINE HAT COLLEGE
MOUNT ROYAL UNIVERSITY
NORQUEST COLLEGE
NORTHERN ALBERTA INSTITUTE OF TECHNOLOGY
SOUTHERN ALBERTA INSTITUTE OF TECHNOLOGY

Improve systems to ensure compliance with legislation—see multi-institutional recommendation

International and Intergovernmental Relations—Alberta's International Offices

Background

Seven years ago[1] we recommended that the Department of International and Intergovernmental Relations improve the processes management uses to evaluate the performance of each international office. We found management did not periodically perform an in-depth review of the international offices to ensure each continues to be relevant and cost effective. The department also did not include variance analysis for measure results compared to targets for individual offices and provide adequate descriptions of its performance measures methodology in its public reporting. Total fiscal 2014 operating cost for the international offices was $8.1 million.[2]

We repeat this recommendation because the department has not fully implemented process improvements to assess the relevance and cost effective performance of the offices.

RECOMMENDATION 16: EVALUATING INTERNATIONAL OFFICES' PERFORMANCE—REPEATED

We again recommend that the Department of International and Intergovernmental Relations improve the processes management uses to evaluate the performance of each international office.

Criteria: the standards for our audit

The department should monitor clear measures of performance by the international offices and effectively manage any risks.

Our audit findings

KEY FINDINGS

- Processes have not been finalized to regularly assess, in-depth, the relevance and cost effectiveness of offices.
- The department currently compares output type measures to targets to assess performance. There are no measures on cost effectiveness or the value derived from the costs incurred.
- Variance analysis of results for individual offices and adequate descriptions of performance measure methodology were not included in public performance reports for international offices.

The department has not finalized processes to regularly assess in-depth, the performance of each international office.

Management utilizes a performance-measure framework comparing output type measures to targets to evaluate each office's performance. The output measures include the number of trade missions and meetings attended, and business introductions made. The department approved a plan in January 2012 for a program review of the international offices. In 2013 the department released Alberta's International Strategy. Appendix A of that strategy document contains a recommendation that the department implement new performance measurement practices. These measures will be based on empirical information to determine whether the international offices are achieving the department's goals and

[1] *Report of the Auditor General of Alberta—October 2008*, page 324.

[2] 2013–2014 Alberta International Office Report, page 36. Total expenditure by office (in thousands of dollars): China - $1,046; Shanghai - $108; Hong Kong - $290; Asia Representative - $798; Taiwan - $251; Korea - $614; Japan - $875; United Kingdom - $1,026; Germany - $478; Mexico - $614; Washington - $545; Washington Representative - $904; Chicago - $59; New Delhi - $144; Singapore - $359.

advancing the objectives of the international and regional strategies. These measures are still under development.

The department formed an international working group to enhance the efficiency of each office. In 2014 Premier Prentice requested a review to ensure the activities of each office were optimally aligned with the government's international strategy. In February 2015 the department identified some cost saving opportunities based on the results of the review. This review may form the basis of the department developing ongoing periodic in-depth reviews of each office.

The 2013–2014 Alberta International Offices Business Report did not include detailed variance analysis for each office and adequate descriptions of performance measures methodology.

To fully implement the recommendation, the department must regularly perform periodic in-depth reviews of each office's continued relevance and cost effectiveness. Variance analysis and adequate descriptions of performance measures methodology for individual offices should be regularly reported and updated as the government's international strategy and priorities change.

Implications and risks if recommendation not implemented

As the global marketplace changes quickly, management needs current and reliable information on the continued relevance and cost effectiveness of each office. Without regularly scheduled, thorough reviews of each office, management may not be able to effectively manage any risks to achieving its strategic goals.

Glossary

REPORT OF THE AUDITOR GENERAL OF ALBERTA

March 2015

GLOSSARY

Accountability for results The obligation to show continually improving results in the context of fair and agreed on expectations. For Albertans to receive value for money, all those who use public resources must:

- set measurable results and responsibilities
- plan what needs to be done to achieve results
- do the work and monitor progress
- report on results
- evaluate results and provide feedback (results analysis)

Accrual basis of accounting A way of recording financial transactions that puts revenues and expenses in the period when they are earned and incurred.

Adverse auditor's opinion An auditor's opinion that things audited do not meet the criteria that apply to them.

Assurance An auditor's written conclusion about something audited. Absolute assurance is impossible because of several factors, including the nature of judgement and testing, the inherent limitations of control and the fact that much of the evidence available to an auditor is only persuasive, not conclusive.

Attest work, attest audit Work an auditor does to express an opinion on the reliability of financial statements.

Audit An auditor's examination and verification of evidence to determine the reliability of financial information, to evaluate compliance with laws or to report on the adequacy of management systems, controls and practices.

Auditor A person who examines systems and financial information.

Auditor's opinion An auditor's written opinion on whether things audited meet the criteria that apply to them.

Auditor's report An auditor's written communication on the results of an audit.

Business case An assessment of a project's financial, social and economic impacts. A business case is a proposal that analyzes the costs, benefits and risks associated with the proposed investment, including reasonable alternatives.

Capital asset A long-term asset.

COBIT Abbreviation for Control Objectives for Information and Related Technology. COBIT provides good practices for managing IT processes to meet the needs of enterprise management. It bridges the gaps between business risks, technical issues, control needs and performance measurement requirements.

COSO Abbreviation for Committee of Sponsoring Organizations of the Treadway Commission. COSO is a joint initiative of five major accounting associations and is dedicated to development of frameworks and guidance on risk management, internal control and fraud deterrence.

Criteria Reasonable and attainable standards of performance that auditors use to assess systems or information.

Cross-ministry The section of this report covering systems and problems that affect several ministries or the whole government.

Crown Government of Alberta

Deferred maintenance Any maintenance work not performed when it should be. Maintenance work should be performed when necessary to ensure capital assets provide acceptable service over their expected lives.

Enterprise risk management (ERM) The systems and processes within an organization used to identify and manage risks so it can achieve its goals and objectives. An ERM creates linkages between significant business risks and possible outcomes so that management can make informed decisions. An ERM framework helps organizations identify risks and opportunities, assess them for likelihood and magnitude of impact, and determine and monitor the organization's responses and actions to mitigate risk. A risk-based approach to managing an enterprise includes internal controls and strategic planning.

Enterprise resource planning (ERP) Abbreviation for enterprise resource planning. ERPs integrate and automate all data and processes of an organization into one comprehensive system. ERPs may incorporate just a few processes, such as accounting and payroll, or may contain additional functions such as accounts payable, accounts receivable, purchasing, asset management, and/or other administrative processes. ERPs achieve integration by running modules on standardized computer hardware with centralized databases used by all modules.

Exception Something that does not meet the criteria it should meet—see "Auditor's opinion."

Expense The cost of a thing over a specific time.

IFRS International Financial Reporting Standards (IFRS) are global accounting standards, adopted by the Accounting Standards Board of the Chartered Professional Accountants of Canada. They are required for government business enterprises for fiscal years beginning on or after January 1, 2011.

GAAP Abbreviation for "generally accepted accounting principles," which are established by the Chartered Professional Accountants of Canada. GAAP are criteria for financial reporting.

Governance A process and structure that brings together capable people and relevant information to achieve results (the cost-effective use of public resources).

Government business enterprise A commercial-type enterprise controlled by government. A government business enterprise primarily sells goods or services to individuals or organizations outside government, and is able to sustain its operations and meet its obligations from revenues received from sources outside government.

Internal audit A group of auditors within a ministry (or an organization) that assesses and reports on the adequacy of the ministry's internal controls. The group typically reports its findings directly to the deputy minister or governing board. Internal auditors need an unrestricted scope to examine business strategies, internal control systems, compliance with policies, procedures, and legislation, economical and efficient use of resources and effectiveness of operations.

Internal control A system designed to provide reasonable assurance that an organization will achieve its goals. Management is responsible for an effective internal control system in an organization, and the organization's governing body should ensure that the control system operates as intended. A control system is effective when the governing body and management have reasonable assurance that:

- they understand the effectiveness and efficiency of operations

- internal and external reporting is reliable
- the organization is complying with laws, regulations and internal policies

Management letter Our letter to the management of an entity that we have audited. In the letter, we explain:
1. our work
2. our findings
3. our recommendation of what the entity should improve
4. the risks if the entity does not implement the recommendation

We also ask the entity to explain specifically how and when it will implement the recommendation.

Material, materiality Something important to decision makers.

Misstatement A misrepresentation of financial information due to mistake, fraud or other irregularities.

Outcomes The results an organization tries to achieve based on its goals.

Outputs The goods and services an organization actually delivers to achieve outcomes. They show "how much" or "how many."

Oversight The job of:
- being vigilant,
- checking that processes/systems, including the accountability for results system, are working well, and
- signaling preferred behaviour,

all in the pursuit of desired results.

Performance measure Indicator of progress in achieving a desired result.

Performance reporting Reporting on financial and non-financial performance compared with plans.

Performance target The expected result for a performance measure.

PSAB Abbreviation for Public Sector Accounting Board, the body that sets public sector accounting standards.

PSAS Abbreviation for public sector accounting standards, which are applicable to federal, provincial, territorial and local governments.

Qualified auditor's opinion An auditor's opinion that things audited meet the criteria that apply to them, except for one or more specific areas—which cause the qualification.

Recommendation A solution we—the Office of the Auditor General of Alberta—propose to improve the use of public resources or to improve performance reporting to Albertans.

Review Reviews are different from audits in that the scope of a review is less than that of an audit and therefore the level of assurance is lower. A review consists primarily of inquiry, analytical procedures and discussion related to information supplied to the reviewer with the objective of assessing whether the information being reported on is plausible in relation to the criteria.

Risk Anything that impairs an organization's ability to achieve its goals.

Sample A sample is a portion of a population. We use sampling to select items from a population. We perform audit tests on the sample items to obtain evidence and form a conclusion about the population as a whole. We use either statistical or judgemental selection of sample items, and we base our sample size, sample selection and evaluation of sample results on our judgement of risk, nature of the items in the population and the specific audit objectives for which sampling is being used.

Standards for systems audits Systems audits are conducted in accordance with the assurance and value-for-money auditing standards established by the Chartered Professional Accountants of Canada.

Systems (management) A set of interrelated management control processes designed to achieve goals economically and efficiently.

Systems (accounting) A set of interrelated accounting control processes for revenue, spending, preservation or use of assets and determination of liabilities.

Systems audit To help improve the use of public resources, we audit and recommend improvements to systems designed to ensure value for money. Paragraphs (d) and (e) of Subsection 19(2) of the *Auditor General Act* require us to report every case in which we observe that:

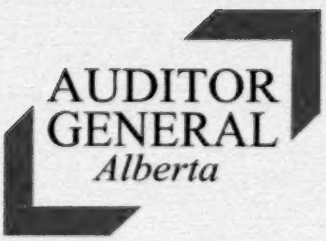
- an accounting system or management control system, including those designed to ensure economy and efficiency, was not in existence, or was inadequate or not complied with, or
- appropriate and reasonable procedures to measure and report on the effectiveness of programs were not established or complied with.

To meet this requirement, we do systems audits. Systems audits are conducted in accordance with the auditing standards established by the Chartered Professional Accountants of Canada. First, we develop criteria (the standards) that a system or procedure should meet. We always discuss our proposed criteria with management and try to gain their agreement to them. Then we do our work to gather audit evidence. Next, we match our evidence to the criteria. If the audit evidence matches all the criteria, we conclude the system or procedure is operating properly. But if the evidence doesn't match all the criteria, we have an audit finding that leads us to recommend what the ministry or organization must do to ensure that the system or procedure will meet all the criteria. For example, if we have five criteria and a system meets three of them, the two unmet criteria lead to the recommendation. A systems audit should not be confused with assessing systems with a view to relying on them in an audit of financial statements.

Unqualified auditor's opinion An auditor's opinion that things audited meet the criteria that apply to them.

Unqualified review engagement report Although sufficient audit evidence has not been obtained to enable us to express an auditor's opinion, nothing has come to our attention that causes us to believe that the information being reported on is not, in all material respects, in accordance with appropriate criteria.

Value for money The concept underlying a systems audit is value for money. It is the "bottom line" for the public sector, analogous to profit in the private sector. The greater the value added by a government program, the more effective it is. The fewer resources used to create that value, the more economical or efficient the program is. "Value" in this context means the impact that the program is intended to achieve or promote on conditions such as public health, highway safety, crime or farm incomes. To help improve the use of public resources, we audit and recommend improvements to systems designed to ensure value for money.



Office of the Auditor General of Alberta
8th Floor, 9925 109 Street NW
Edmonton, Alberta, Canada T5K 2J8

Phone: 780.427.4222
Fax: 780.422.9555
Email: info@oag.ab.ca
This report is available at www.oag.ab.ca
ISSN 1927-9604